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BRAIN CULTURE THROUGH
SCIENTIFIC BODY
BUILDING

Parsons, Theodore & Grace Parsons
Dra. Dr. Parsons

Brain Culture Through Scientific Body Building

By
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With Preface by
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With Eighteen Illustrations From Photographs
By Matzene



1912

THE AMERICAN SCHOOL OF MENTAL AND
PHYSICAL DEVELOPMENT
FINE ARTS BUILDING, CHICAGO

G 4341
P. 1

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By

THE AMERICAN SCHOOL OF MENTAL AND
PHYSICAL DEVELOPMENT

\$1.50

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No. 1

Dedication

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To the Parents and Teachers of this country, who
are moulding the present and future generations, this
book is tenderly dedicated by the Author.

*“See that through thee the race
progresses, not continues only.”*

—NEITZSCHE

PREFACE

The worldwide present movement for the scientific preservation of life and health has awakened a great interest in the scientific training of the Body. The care of the health is the first duty of both home and school. Questions of food, exercise and air are fundamental. There is need of great reform and widespread public attention on many problems of the physical life of the child.

The duty of parents toward their children does not end with giving them birth and sustenance. They must use every means of bringing them to healthy and complete maturity. Parents should be taught how to do this, for upon it depends, more than upon anything else, the future of the race. Parent, teacher and physician must co-operate to keep the child normal, strong and healthy.

One of the best means of preserving and increasing the health of child and youth is carefully regulated muscle culture. Children are by nature full of motor impulses. We are coming to understand that activity is the keynote of life. The New Education must be at bottom activity, involving muscle and will, if it is to prepare for life. It is far better to train a child so that by activity he adds ever so little to the values in the world, than that he should

store up an exhaustive amount of unexpressed knowledge. Establish good muscle habits in childhood, for they are fundamental in the education of the will and the emotions.

Considered from the genetic point of view, most of the old-time physical training seems narrow and inadequate. There is great latent talent that in our present methods never comes to expression, and the study of which may do far more for the body and mind than we yet perceive.

From this standpoint we can say in the most general terms that the purpose of the artistic training of the Body in its broadest sense is to restore the motor elements of expression to their rightful place in mental and physical education; and rightly conceived, it may be called a liberal humanistic culture of the emotions through motion. Such training serves a great purpose, for it helps to develop and to balance the emotions by directly exercising the organs of control and expression, teaching Expression in Movement. This line of education is being carried forward by a few well known teachers, pioneers in this great new field.

One of these teachers, Mrs. Theodore Parsons, has made this subject a life study, and has given us a system of Physical Education complete in its systematic wholeness and practical application, for the training of the body, from the scientific and artistic standpoint; the result is a unique method of Expressional training.

Mrs. Parsons brings to the preparation of her work fifteen years of active teaching, and her devotion and sincerity are reflected in her enthusiasm; also she is a finished illustrator of her Art. The beautiful Posture Pictures show her results, and her enthusiasm is justified. Like all enthusiasts (and all good teachers must believe in themselves), she attempts to dip into my world, and yours perhaps, but if she can lift the individual out of the physical rut, kindle a sense of physical beauty of form, and stimulate a desire for greater and higher physical efficiency, we shall be the last to object, and many whom we all know, in looking for Beauty have found Health, Love and Happiness. The perfecting of the quality of the human machine, so that its output may be of the finest and highest type, is one of the greatest needs of our day.

Those who cannot directly come under Mrs. Parsons' influence can at least get the wonderful inspiration of her method through this book, and begin at once to seek within its pages what all desire so much, the attainment of the fullest of physical and aesthetic development.

What wonders can be accomplished is seen in our own day, by the incomparable Sarah Bernhardt, who tells of herself that she was such a grotesquely ugly child her mother used to apologize when people observed her; the mother's friends used to commiserate with her openly, and it was hearing remarks of this character made in her presence, in which the

mother sighing said, "I don't know what will ever become of her," that the child Sarah clenched her hands and said to herself, "I will show them. I will force people to bow to me." She has made every muscle alive with expression, compelling our attention. She is Energy vitalized, and Culture symbolized, and her spirit is no less compelling than her physical expression. She is Culture, Art and Soul embodied.

There is little else to say in a preface except the above testimony, and to add that here is a method of physical education which the evolutionary view asserts to be fundamental and normal, and to this I very gladly bear witness.

EFFIE L. LOBDELL, M. D.

President of Medical Women's Club of Chicago.

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INTRODUCTION

Today an urgent need imposes itself upon society; the reconstruction and revaluation of methods in education and instruction. This important reformation should begin in the Physical Education of our children, and they who labor for this cause labor for human regeneration.

During the past few years noted educators have urged a thorough revision of the methods of physical training in our schools; the great necessity then is to convert these opinions into social action and originate legislation to compel the educative agencies of this country to abolish outworn and injurious systems of physical training.

There have been many able scientific works given to the public on physiology and psychology, but none of them have combined a discussion or indicated the possibilities of the broad principles belonging to

physiology and psychology, in their practical bearing on manhood and womanhood. Only in recent years has the great importance of considering the psychological aspect of play, gymnastics and physical training been recognized; in fact, there is almost no literature upon the subject.

The author is at present under the necessity of confining herself to a presentation of an outline of her method of expressional training, owing to the demand of her pupils in the various schools, seminaries and colleges, where she has directed the physical and dramatic work. With the subject thus narrowed to the fundamentals of Scientific Body Building, the author considers this monograph as an introduction to a far more comprehensive work, the aim and extent of which it only indicates.

From the school, until recent years, we have had only the one-sided mental training which Physicians are beginning to understand is the first great cause of the widespread nervous diseases of today. One of the promising signs upon the educational horizon is the scientific training of the body.

The crowning achievement of this century will be the prevention of disease, and the vital work for medicine today is to see just how much can be done to change inherited defective nature, to alter inherited defective structure.

It is one of the triumphs of modern science that it has succeeded in clearing away the ancient idea that mental disorders belong to a totally different class from ordinary bodily ills, and many years of observation of mental and nervous disorders have proved to the author's satisfaction that nearly all abnormal mental manifestations are the result of a deranged body.

Our systems of education are imperfect so long as they fail to inspire the youth of this country with the sacred ambition for physical perfection, and help him to the method of expressing himself in the noblest form which he may be capable of attaining. Every child should feel that he is the builder of a Temple called his body. We are all sculptors in the daily carving out from the material of flesh, blood, and bones, a living, breathing statue, far more beautiful than

any designed by the ancient Greeks.

Scientific Body Building, rather than the training of gymnasts and athletes, is the aim of this work, not bulging muscles or phenomenal skill in some specialty, but sound health, grace and endurance. The antiquated methods now in use should be done away with, as Science has proven that the overdevelopment of the muscles in arms, chest and legs is now looked upon as a calamity, for they really tend to shorten life unless the vital organs are proportionately developed to take care of them.

During the last fifteen years the author has carried on a series of experiments with reference to a deliberate application of specific physical exercises, to the improvement of the forms and functions of the human body, and finds that by cultivation of the muscular system incipient deformities not only may be arrested, but considerable malformations may be overcome, and that shrunken, deformed and twisted bodies may be built up into lines of symmetrical beauty.

In education, the true chronological order

is the body first, and the brain after, for the body needs education as well as the brain. Education in its highest sense should be the conscious training of mind and body to act unconsciously.

The exercises in this method of expressional training are based upon the principles of muscle culture. It is not merely that physical training keeps the body in good trim, but the very growth of the brain depends upon the growth and use of the muscular system. If the human being is not to retrograde, he must keep fundamental and accessory muscles, up to their perfect and symmetrical development, for scientific training of the body is a true brain stimulant.

The author believes that nine-tenths of the diseases from which school children suffer are caused by an insufficient amount of exercise.

G. Stanley Hall says that gymnastics with apparatus is distinctly anti-physiological, and the author has found that many of the exercises in schools and colleges may prove quite harmful. Children suffering from spinal trouble or hip difficulty are

likely to be injured from exercises unless they are definitely prescribed by a trained specialist, for there are always abnormal conditions present which must be specifically treated. Certain deformities of the figure may be due even to deficiency of exercise, to the excessive immobility of the individual. If we are to have regularity of form and beautiful bodies, we must adopt exercises in which all parts of the body regularly perform work in proportion to the strength of their muscles.

Only a few years have elapsed since the work of noted scientists has revealed to us the possibilities of the New Education. Patient effort and scientific experiment have produced astounding results in building up the brains of feeble-minded children; and in applying some of the experiments to children of average intelligence, they have progressed rapidly, both physically and mentally.

The fundamental error in much that passes for good education is in providing too much surface and too little depth. In the effort to improve our schools, the mistake

has been made of increasing the curriculum instead of the teaching force. The first business of education is to make sound physical and moral fibre, and human fibre of any kind is built only by constant and judicious exercise. Therefore, common sense would dictate that where there is any physical weakness, the less strong part of the body should be so trained and developed as to equal strength with the rest. This method has been designed to train Expression, Strength and Endurance in the body, and the author believes that one of the broadest avenues to Ethics and Esthetics is through the artistic training of the body, whose possibilities as a culture study are almost wholly undeveloped.

The supreme aim of Education should be to foster sound and capable bodies, to develop well-trained minds, to build up strong, self-reliant characters. Wherever there is a child born with physical infirmities, there is a mental and physical cause back of it, and for every broken mind there is some one to blame, somewhere in the past. Parents who are coarsening with luxuries, do not stop to

think that they are sending down that blood to future offspring, that will reflect it in the mental and nervous distortions of the future generations that will succeed them, and that inevitably bear the greater penalty. Insanity (in which may be classed all nervous distortions and perversions) is never without blame from some source. Luxury of diet, of living, of habits, and a long continued abuse of the wholesome laws of life, will weaken the mental and physical faculties more in the generation that follows than in that which is guilty.

Let us look for a minute at the career of one of the greatest poets of the nineteenth century. Oscar Wilde's life at Oxford University was one that occasioned great admiration from students and faculty. It was marked by chastity and great devotion to his studies. A few years later, the decadent atmosphere of the drawing-rooms of London and Paris drugged his moral sense, and Oscar Wilde paid in his innocent person the toll that nature exacted for the centuries of conviviality of rollicking ancestors, and the irony

of the gods sentenced him to the silence of the tomb, in the two most fruitful years of his life, when his genius had reached its apogee. He to whom expression was life, nay, more than life itself, was suddenly reduced to silence more silent than the grave, and he who had made a name glorious in literature, had only a number in a cell. His was worse than suffering, his was a tragedy, and one of the greatest tragedies of the nineteenth century.

If ancestry is to blame, then let us protect future generations and make of Heredity the prime factor of a constructive future for the race. The concept of a regenerated humanity, as the goal of human progress, immediately lays the foundation of a scientific revaluation of all the instruments of education. Let us begin then with the body which is the foundation. Individually, and in a very few cases, it may be true that noble minds accompany diseased bodies, but the rule is obviously the reverse.

“I see a race without disease of flesh or brain, shapely and fair, married harmony of form and function, and as I look life length-

ens, joy deepens, love canopies the earth,
and over all in the great dome shines the
eternal star of human hope.”

PHYSICAL EDUCATION AS A SCIENCE

CHAPTER I

Physical Education as a Science

Physical Education as a Science has only recently been born. The new science of Scientific Body Building is based upon the recent and remarkable discoveries in physiological science, especially that of brain localization. One of the first results of these discoveries is to impart an entirely new aspect to the important subject of Physical Education.

We must face the fact that the ultimate verdict concerning the utility of the School will be determined by its moral efficiency in saving children from personal vice and crime. A brief historical review of modern discoveries in brain localization,—the physical relations of brain to the mind, and of the correlations of brain cells and muscle cells would seem to be a fitting introduction to this course on physical education.

Now that we know how soul and body together build up or undermine each other, people are beginning to demand a higher, a more scientific physical education in relation to the holiness and rights of the body. Modern scientific research has revealed certain material seats of purely mental function. The most important, and of the first to be discovered, was the specific anatomical seat of speech.

On April 14th, 1861, an eminent French hospital surgeon, Paul Broca, read a paper before the Societe d' Anthropologie of Paris in which he adduced evidences to prove:

That there is a definite locality in the brain which is the sole seat of articulate speech, found in a limited area in the lower and posterior part of the convolution, called the third frontal and which is now named "Broca's convolution." This tiny patch of gray matter is situated a little in front of the tip of the ear. This speech center, curiously enough, in the great majority of persons, lies upon the left side of the brain,

and is the only one-sided center in the body. This discovery is one of far-reaching significance in regard to the problem of ambidexterity, that the anatomical seats of the faculty of speech are found only in one of the hemispheres.

The facts which led to the discovery were cases of sudden paralysis, suddenly occurring on one side of the body. If it happened to be the right side which was paralyzed, the side which is governed by the left brain motor or uttering speech is also very commonly affected. The reason for this is that Broca's convolution, which contains the center for motor speech, is situated in that part of the cortex which is called the motor area, because from that area proceed those excitations of muscular movements which are of a voluntary kind.

A powerful spurt of blood from a ruptured cerebral artery may so tear the brain tissue as to involve these motor centers or the fibres leading from them, and so destroy the Broca convolution. Postmortem exami-

nations fully confirm this statement; meantime, as the right hemisphere is then found to be quite unaffected including the right Broca's convolution, it is very plain that the loss of speech is due exclusively to the injury to the left hemisphere.

On the other hand, while loss of speech ordinarily accompanies right-sided but not left-sided paralysis, some cases have been reported in which it accompanied left-sided and not right-sided paralysis. These cases were published along with the significant postmortem findings of damage to the right instead of the left Broca's convolution. In other instances, in patients who with left-sided paralysis, and loss of motor speech, had also shown word blindness during life, not only the right Broca's convolution, but the region of the right angular gyrus was likewise found damaged. As the corresponding places in the left hemisphere were intact, it followed that in these persons the speech centers were in the right brain and not in the left. But it was not long before

this seemingly curious anomaly found its explanation, which is, that right-sided paralysis, with loss of speech, occurs in right-handed people, and left-sided paralysis, with loss of speech, occurs in persons who have been left-handed in life. In other words, the faculty of speech is located in the hemisphere which governs the hand that is most used.

Hand and speech, therefore, are physiologically connected. This remarkable fact brings us back to the origin, to the very beginning of this wonderful faculty of Expression in the human race. It began by one personality longing to communicate with others, and the first thing which it did then, as every human being still does when endeavoring to communicate with those whose vocal speech he does not know, was to make gestures with his hands.

Gesture language, therefore, was the first language, and few persons are aware how much gesture language still continues in living use. We all know the significance of

the hand in human history. It was by virtue of the hand that we gained lordship over the earth. It was the hand, wonderful mechanism, evolving out of the directing will an ever increasing subtlety and power, that made possible the human brain. It is not necessary in a book of this kind to give a detailed indication of the specific relations of the main brain centers. We know now that each of the special senses has its anatomical seat in the brain, and in addition to that, in a centrally placed zone, are to be found the seats governing the voluntary muscles of the body.

The relations of mind and body are so intimate, that the building up of one is indispensable to the building up of the other. One of the most important results of scientific body building, is the fact that certain portions of the brain, which preside over voluntary movements are developed by muscular exercise, just as certain other parts of this organ, concerned in intellectual operations may be developed by mental work.

The nervous working which goes on in the gray matter of the brain, for the purpose of throwing a muscle into action, must influence the nutrition of that portion of the brain, just as much as contraction influences the nutrition of the muscles.

It was a fortunate step for psychologists, when they turned away from metaphysical abstractions and gave their attention to the study of the nervous system. One familiar with the history of modern psychology, knows that it was by clinical observations, by autopsies, and by experiments on animals, that Gall (1806), Flourens (1820), and Foville (1840), proved that the psychological processes are correlated to physiological processes, in the cortex of the brain. He knows that it was in the same way that among others, Bouilland (1850), Broca (1860), Fritsch and Hitzig (1870), proved that the whole cortex is not of the same significance, but that certain psychological processes are attached only to physiological in certain parts of the cortex.

It was through his observations of two now famous cases, that Broca (1861), discovered that the function of speech is centered in a part of the brain less than two centimeters in diameter, in the left third convolution. It was through their observations of still more cases that Wernicke, Lichtheim, Kussmaul, and others gave us what little knowledge we have of the processes involved in reading and writing. It was through clinical observations, that Carl Lange was led to investigations that resulted in his theory about the nature of emotions, wellnigh the most important psychological discovery in the last fifty years. That this theory now is a part of common knowledge is due much more to that American physician, the genius among American psychologists, William James, than to Lange himself.

Some persons may find it difficult to accept the demonstration of the personal will as an active agent in fashioning brain matter, because it implies that a purely spiritual

agency, such as they imagine the will to be, can cause definite material effects. This need not be wondered at, because there is no one word about which the fogs of metaphysics have gathered so thickly as about the word "Will."

We advise them to let metaphysics alone and turn their attention to the actual facts, which we have been considering. A brain center used for speaking is certainly an actual material fact, or else it could not be destroyed by a pointed stick. This material fact was made by a specific nerve stimulus repeatedly acting on that collection of brain cells, till it was fashioned accordingly, and all the other brain centers are fashioned by the specific nerve stimuli.

For instance, a ray of light is a specific stimulus to the nerve cells of the retina, from which this stimulus is propagated by the optic nerves to the cells of the visual area in the posterior lobe of the brain. Now the effects of overstimulation of nerve cells have been experimentally observed in ani-

mals, by exposing one eye to a strong light, while the other was left dark, and then contrasting the appearance of the cells, which had been overworked, with those of the other retina, which were kept at rest. The first effect of such stimulation is to cause the nerve cell to swell by absorption of the nutritive lymph, in which it is bathed, but as it becomes fatigued by the continuous stimulation, the cell shrinks, its nucleus becomes displaced, and at last the whole cell becomes disorganized into dead stuff. The chemical results of this degeneration have been studied and reported to be a change from the normal protoplasm of the cell with its phosphureted neutral fat.

But this is just what happens to the nerve fibres and nerve cells in a small spot, in the brain motor region, which orders the right thumb and forefinger to hold a pen. If the will does not let up on this order long enough to let those motor nerves of a book-keeper have a rest from its stimulation, we have a case of writer's palsy, with the same

degeneration of motor nerve matter, and as a result, total atrophy of both the nerves and the muscles which they supply. Here, therefore, the will has ended its activity, with precious nerve matter turned into poor neutral fat, said fat being no more a thing of metaphysics than is a billiard ball.

It is overstimulation in both cases, but the stimulus of light comes from the outside, and that of the will from the inside. But does the latter fact make the will less of a reality than is light, when it actually causes the same kind of physical and chemical changes?

One of the most important conclusions to be derived from these facts is that we can make our own brains, so far as special mental functions or aptitudes are concerned, if only we have wills strong enough to take the trouble. By the most constant practice, as in Miss Keller's case, the Will stimulus will not only organize brain centers to perform new functions, but will project new connecting, or as they are technically called,

association fibres, which will make nerve centers work together, as they could not without being thus associated.

Each such self-created brain center requires great labor to make it, because nothing but the prolonged exertion of the personal will can fashion anything of the kind. The individual must do it all himself. A person, therefore, acquires new brain capacities by acquiring new anatomical bases for them, in the form both of brain cells which he has trained, and of actively working brain fibres which he has himself virtually created.

This subject should especially commend itself to the serious attention of all educators. Every teacher and parent ought to learn all that they possibly can about this subject.

We are not responsible for the thoughts which enter our minds, but we are gravely responsible for the thoughts which we allow to stay there, because we have a kingly power within us which can command this

mechanically thinking brain to do its thinking according to its orders, just as the brain in turn can command the spinal cord to stop acting reflexively to its afferent excitations, but to act only according to the brain's behests. A brain however well developed it may be, is of no use to its owner, unless through discipline, the will has been so trained as to develop its mastery.

We cannot overestimate the priceless value of such discipline. A mind always broken in to the sway of the Will, and, therefore, thinking according to will, and not according to reflex suggestion, constitutes a purposive life. Such a man or woman is the very embodiment of living power. But the important and practical truth to apply here, is that no power so grows in us by exercise, or so weakens and atrophies by disuse, as the Will.

Teach a child self-restraint and you are directly developing thereby his will power. Soon he will learn the next lesson in will development and win Carlyle's great equip-

ment for life—"the ability to take trouble." But physiology now adds that the will then alters the brain, by creating new places for the mind to work with. It is the will which creates the man. All will culture is intensive, and should guard us against the chance influences of life. It makes strong bodies obey.

Let me add with much emphasis, that the training of the body, of memory, and of the will, are the most important factors in the education of the child; in the training of the memory, it is of especial importance. Memory is often a gift, but mainly an acquisition, and can be immensely strengthened, if one has the energy and perseverance to set himself to the task. I have known people of advanced years, who having discovered that this faculty was becoming enfeebled and treacherous, set themselves deliberately to work to re-energize it, exactly as one who feels that the muscles of his body are becoming less pliant, can correct this defect, and strengthen the whole body. By way of

suggestion to parents and teachers, I should say you must first arouse a desire for a fine memory and this can be done in a simple way. Select an interesting story, read it to a group of children, and after the reading is finished, require them to reproduce it. The effect will be to weave his powers of attention, comprehension and memory, into a single strong, compact cord. Try it. I have never found it to fail. We will leave the discoveries in brain localization, pass over many interesting phases of discovery, skip a few decades of experimentation, and take a brief glimpse of the first experiments of a great American Scientist.

Professor Elmer Gates was an ardent believer in the transmission of acquired characteristics; after some study, he became convinced that Weismann's experiments and conclusions concerning his study of white mice was faulty. The theories of Weismann and other writers on heredity, reached from wrong premises, that acquired qualities or characteristics are not transmitted,

are ably contradicted by such scientists as Byer and Gates, as well as by such physicians as Sydney, Barrington and others.

Professor Gates' experiments have contradicted the conclusions of Weismann and others regarding heredity. They claim that we have no proof of a skill, an idiosyncracy or a habit acquired, during the lifetime of an individual being transmitted to that person's offspring. The mutilation of a Chinese woman's foot, they say, is not transmitted. Professor Gates says it could not be transmitted, because the change does not originate in the brain.

Weismann cut off the tails of mice for twenty-eight generations, but the tails of the last generation were as long as those of the first generation, hence Weismann concluded that the acquired characteristics could not be transmitted from parent to offspring. Professor Gates saw, so far as the mice were concerned, that cutting off their tails was not an acquired characteristic, but simply an accidental deformation.

In defense of his theory, he trained white mice to use their tails, compelling them to distinguish between different weight pressures, touches, temperatures of heat, and currents of electricity. By this method, the mice were compelled to use their tails, which resulted in the development of new brain cells, and a corresponding development of the tail, in strength and activity. The fifth generation of these mice was born with tails two and a half times as long as the tails of the first generation; the tails were also much larger, much stronger, and much more sensitive and active. This result was the transmission of acquired characteristics.

In every single case the characteristic of the animal was transmitted to the offspring, whenever a parent had made an effort to distinguish certain activities or conditions relating to itself. And in every case where the effort was not made, the acquired characteristics were not transmitted. Dogs trained from puppyhood to distinguish

many shades and tones of color gave birth to young who were able, before any training had been given them, to distinguish many more colors than ordinary dogs ever could. Guinea pigs were trained to distinguish musical tones. This development was transmitted, and the brain cells of the hearing region of the offspring of the guinea pigs were better developed at birth than the brain cells of the ordinary guinea pigs are at maturity.

Professor Elmer Gates has evolved a practical art of brain building by scientific training of the Body, which causes an increase in the structural elements of the Brain cells and whole nervous system and increasing mental capacity and skill, hence the very growth of the brain depends upon the growth and use of the muscular system.

To the research work done in physiological psychology then we owe the new system of Physical Education, which has proven that one muscle overdeveloped and extraordinarily strong, indicates a brain center

overdeveloped; another muscle underdeveloped and proportionately weak indicates a brain center in a semi-atrophied condition.

The old-time teaching was to the effect that as a man's tendency at his birth, so would his characteristics be shaped. Modern psychology teaches us that we can do with ourselves what we will, no matter what ancestral trait has been reproduced. We ought to be proud indeed to know that we owe these marvelous discoveries to the vivid intellect of an American, Professor Elmer Gates. He has proven that all excepting congenital idiots can be helped and cured.

One of the most important results of modern scientific research is the new light that is being thrown upon the scientific training of the body. Indeed, I have come to regard the body as the great psychological quarry of the brain, and we begin to realize that physical education as a science has just been born.

And now we are trying to do in the realm

of human life, what Burbank has done in the realm of plant life. Burbank has gained a wide reputation because of his improvement of useful plants. He has produced a new kind of potato which has raised the value of the potato crop by about 3,500,000 bushels per annum. He cultivated great numbers of fruit trees with the object of increasing their utility.

Through the experimental research work, we have arrived at a more systematic method of developing the minds of children. The great value to humanity of the work done by Luther Burbank, in the plant kingdom, and in the experiments of Professor Gates in building brain cells for animals and children by patient, steady labor will produce a wonderful race of human beings in a few generations after the enlightened few become the illuminated many.

EXERCISES FOR STIMULATING BRAIN CENTERS

CHAPTER II

Exercises for Stimulating Brain Centers

The exercises in this chapter are especially devised for stimulating the motor centers. It must be remembered that it is not advantageous to make children who are suffering from excessive mental fatigue; go through a daily routine of useless mechanical exercises, for the bodily exercises must be definitely prescribed in order that they may awaken and stimulate instead of fatigue, they will then have a double effect, and will extend their benefits to the wearied brain of the child, as well as to the tired body.

Muscular exercise will then act as a salutary counterpoise, to re-establish the balance of the system which has been upset by excessive mental effort. Physical exercise carried to the point at which it produces extreme fatigue is not only injurious, but produces poisons in the system. Let us

look for a moment at the exercises of the ancient Greeks. We find that balancing exercises were the most prominent feature. Balance and breathing exercises represented the keynote of their method of physical perfection.

In my classes I insist upon deep breathing before taking any of the exercises; also a position of perfect poise. The crown of a beautiful physique is correct bearing and artistic poise. This desideratum, however eagerly sought, is not usually possessed by athletes. Grace in figure and carriage is sacrificed on the altar of antiquated ideas of huge muscles. This method is designed to minister to the actual needs of professional and lay people. The exercises evolved are to develop and build up perfect bodies, to give grace, endurance, strength and health.

Balance—the one great fundamental law of all the arts—is the most essential of bodily exercises. The balancing exercises have a tremendous value, and reveal in many in-

stances a possible remedy for such serious diseases as some ataxias, paralysis, and diseases (not organic) involving loss of control of muscles and nerves.

One interesting case which occupied my time and attention this year, was that of a young attorney, twenty-eight years of age. He had been under treatment for a year at a well known Sanitarium for a nervous disorder, and returned home apparently cured. Some months later he came to my studio for some work in voice culture, as he wished to resume the practice of his profession. During the first few lessons there was noticed in his walk a peculiar deviation from the right lines. Later he manifested a decided incoordination in the gesture work. I felt that his recovery had not been complete, so I gave him various exercises ostensibly for grace in gesture, but really for developing muscular control, and finally he was led up to the difficult balancing exercises.

An interesting observation recorded by

Dr. Luys, in his work on "The Brain," may serve as an indirect proof, that after the loss of the function of a limb, certain parts of the gray matter of the brain undergo atrophy, due to inhibited action of the motor cells. If defective action can cause atrophy of the cells which preside over certain movements, we cannot refuse to admit that their frequent activity should promote their increased development.

In the exercise for forward balance, the body should be perfectly poised and relaxed, then extend right foot and right arm in a straight line in front of the body, slowly bend from the hip joint, place right hand on the floor, then raise the hand from floor, raise left foot from floor, stand balanced on right foot for one minute. In my classes I insist upon each movement being immediately reversed, so that the corresponding nerve centers in the brain hemisphere shall be equally stimulated. These intricate balancing movements call for the highest development of coordination between brain,

nerves and muscles. I have found them a panacea for persons suffering from spinal deviation, nervous and digestive disorders.

The world wide demand for security against disease, and for higher physical efficiency, must result in a more thorough medical inspection of our schools, or what would be more rational and economical, the forced inspection of children in their homes before being permitted to go to school. We must have new schools, for our children now need the training of their muscles as well as their minds. They need the training of their minds through their muscles. Few realize how much coordination between muscle and brain means to the normal individual. We know that the brain is taught by the muscles, as well as by the function of ear and eye, and that fully ninety-eight per cent of our life is guided by muscular sensation.

In scientific physical training the mind becomes the master and the muscles of the body, the servant. The body becomes

vivified, the nervous system strengthened, the brain dominates the clamour of the senses, and is free to use the vital currents for the highest and noblest service.

The exercises given in this course stimulate the brain and open up the way, making it easier for the blood to circulate. The sense of balance is governed partly by the feeling of the muscles, partly by the sense of sight, and in part by an organ in the ear, the center of equilibrium.

Patient effort and scientific experiment have produced astounding results in bringing out the qualifications of sub-normal children, and in correcting the physical misfortunes of little ones. Indeed, we know now that many forms of arrested mental development are related to bodily disease, and that when the latter is corrected the brain becomes relatively normal.

In visiting institutions for the feeble-minded and imbeciles, one cannot but be impressed with the shambling gait and the weak leg powers of idiotic children. Certain

specific leg exercises, especially those used in balancing movements, overcome the incoordination between brain and muscle.

The nerve cell activity involved in the muscular action of a muscle must influence the nutrition of a portion of the brain, just as much as contraction influences the nutrition of the muscle. It is then evident that certain portions of the brain which preside over voluntary movements, are stimulated by muscular exercise just as other parts of this organ that are concerned in intellectual operations, may be developed by mental work. It also affords a convincing illustration of my claim that all education, all culture, should issue from a well-rounded development of the motor side of life.

A well known writer on the subject of heredity says: "wherever genius is observed, we find it accompanied by degeneration, which is evidenced by physical abnormalities, or mental eccentricities," but he should have specified that it is only the genius of æsthet-

icism, or the genius of emotion, that is generally accompanied by unmistakable signs of degeneration, for if we go into the studies of the lives of mechanical geniuses, we find that they do not, as a rule, show signs of degeneration. I refer to Darwin, Galileo, Edison, Watts, Rumsey, Howe and Morse to prove the truth of this statement.

Manual training is of inestimable value, requiring the coordination of eye and hand, and at the same time knitting together the cerebral areas concerned, resulting in a general betterment of the organization of the brain. Of great interest to parents and teachers of backward children are the specific exercises for arms and legs, as weakness of the leg muscles follows the lack of co-ordination between head and feet. Of most vital importance to all, is the amount and quality of the circulation of the blood in the brain. The nourishment, growth and development are dependent upon this, as there can be no conscious act in the brain, except where there is circulation of the blood.

Improved physical development of children may be brought to a degree of normal growth by a series of specific exercises of the arms and legs, associated with an intelligent teacher, who suggests continued effort until the child's training permits it to act automatically and establishes the correct habits. Physiology teaches us that whenever a nerve is stimulated, or whenever a muscle contracts, an electric impulse flashes along the nerve and through the muscles; manipulation of the wasted limbs of a paralytic will for this reason cause the muscles of the limb to grow, and restore the lost vitality.

The position of the vital organs is dependent upon the tone and elasticity of the supporting tissues, which hold them in their proper positions. These supporting tissues reflect the condition of the muscular system. If the muscular system be weak and flabby, relaxation and a long chain of troubles follow. Exercises in such cases tone the structures and aid in correction.

The first thing to be acquired before tak-

ing any of the exercises, is a correct standing position. We take our line of the body from the Greeks. See that your body is in such a position that a line will pass through ear, shoulder, hip, knee and ball of the foot. Get the position before a glass and practice it until it can always be maintained. It gives ease, grace and strength.

Of special interest to the boys is the Military Position:

1. Heels in line and together.
2. Feet turned equally outward, forming an angle of 45 degrees.
3. Knees straight.
4. Body square to the front.
5. Chest expanded and advanced.
6. Arms hung easily to the side.
(Swing them out, and let them drop like a pendulum.)
7. Shoulders equal height.
8. Shoulder blades flat.
9. Head erect, raised at the crown as if suspended by a cord, and not tipped in any direction.

10. Chin, slightly drawn in.
11. Form raised to full height.
12. Body poised slightly forward so that the weight bears mainly on the ball of the foot. Eyes, straight to the front.

When walking or standing, toes should not be turned outward at an angle of forty-five degrees, (this I mentioned only to quote the true military position). I know this has been taught in schools, gymnasiums, and the army for years, but this awkward and unstable position destroys the correct balance, and produces weakness, and in time, even deformities. I believe that the enormous increase of flatfootedness is due to the custom of toeing out, which is commonly taught as the correct position.

The following exercises will be found invaluable for equalizing the circulation, for aiding digestion and for promoting natural breathing:

Exercise 1. Carry the weight of the body as far forward as possible, hold position while you count seven, then carry the body

backward as far as possible while you count seven. This must be done without lifting the heels, or bending the knees. Also of great importance is the point from which the movement starts. Always start the movement from the ankle joint. Inhale deeply while counting.

Exercise 2. Same position. Bend slowly from side to side, keep knees straight and feet firm.

Exercise 3. Hands forward on hips, bend trunk at hips slowly forward, rise slowly and bend backward, always keeping the head in position with the body.

Exercise 4. Correct standing position, inhale deeply, arms extended at sides, touch the shoulders lightly with the tips of the fingers; bring the elbows slowly in front of the body, touching them together, lift elbows as high as possible, throw elbows back and up, the fingers still touching shoulders, bring them back to starting position—expel air from lungs. This exercise elevates the ribs, and expands upper and lower parts of chest.

Exercise 5. Correct standing position. Inhale. Finger tips to shoulder, inhale while you count twenty, then with clenched fist, strike downward, and forward, stop suddenly as if striking an object. Expel breath forcibly with the motion. If the motion is decisive, the breath will naturally be expelled by the diaphragm.

Exercise 6. Kneel on a cushion, knees far apart, stretch arms upward, parallel with each other by the side of head, bend slowly backward as far as possible, remain to count four, return forward as far as possible, keeping knees and feet firm. This is one of the best exercises for strengthening the muscles of the back and pelvis.

Exercise 7. Same position, hands clasped on top of head, move the body from side to side very slowly with each movement, and then rest. In the same position, twist the body from right to left.

Exercise 8. Same position, arms extended horizontally forward, throw them backward in a direct line, as far as possible.

This may be practiced quickly or slowly as if carrying a weight.

Exercise 9. Reclining upon back, flex knees, and sway them from side to side.

Exercise 10. Same position, flex and thrust the limbs downward alternately.

Exercise 11. Reclining face downward, flex knees and sway feet from right to left, then from left to right.

Exercise 12. Same position, with the help of an assistant, flex and extend the limbs, using resistance.

Exercise 13. Same position, rest on elbows and sway shoulders from right to left.

Exercise 14. Same position, elevate the body slowly, resting only on toes and elbows.

Exercise 15. Recline on back, and make hand thrusts upward, outward, forward and downward.

Exercise 16. Reclining on back, flex the knees with the help of an assistant, extend the limbs alternately, using resistance.

In all these exercises it is persistent, patient effort that gives decided results. One

will not see their effects in one day, nor in one week unless it is in greater freedom of breath. At first soreness may follow the use of muscles unaccustomed to exercise; a wet compress or a hot bath will relieve this.

These exercises should be taken in loose clothes, at stated times. The best time is before the morning bath, and before retiring at night.

Going up and down stairs is a fine exercise; in order to get the best results, one should keep the mouth closed, fill the lungs with air, hold the breath until the top of the stairs is reached, and then expel slowly. In doing this the diaphragm and abdominal muscles have been brought into action by the deep breath, while the muscles of the thigh, pelvis, perineum and groin, are all engaged in elevating the body. Each time the thigh is raised, pressure is made upward upon the abdominal viscera, which if there is not outside counteracting force, (such as corsets or bands), are pushed outward and downward. Going up and down stairs,

two steps at a time, is also a fine stimulating exercise.

Physical education appeals to some of the deepest of all interests. It is based upon the most generic of all instincts, the instinct of activity, the tendency to display energy, skill and endurance. It is the inspiration for the development of the special instincts, and the essence of originality in culture. It is associated with the most fundamental activities and emotions of the human race.

One of the distinctive features of the course, is the special emphasis laid upon exercises prescribed for groups of muscles, which remain unused in the series of ordinary exercises. This is particularly true of the muscles and ligaments of the back, neck and shoulders, for common movements and industry, and even games which train only a limited number of muscle activities and coordinations. Every unused muscle or tightly bound organ deteriorates through the inactivity thus induced. Immobility must be replaced by mobility. This brings

us to the most important phase of this work —where Expression comes as a natural result of the associated training of widely differentiated faculties, and so creates a desire for physical beauty of form, the result of which is a decided moral effect.

OPENING UP THE MAIN ROAD
TO THE BRAIN

CHAPTER III

Opening up the Main Road to the Brain

Interesting and important as it is to find within our grasp an educational system beyond the ordinary scholastic means for unfolding the human intellect, attractive as it may be to contemplate an effective mode of removing bodily difficulties without recourse to drugs or any painful or unpleasant physical appliances, to know how to improve morals or to develop the moral sense in those who seem deficient of conscience or moral feeling, still the task remains to find the teachers fully equipped for this greatest of all work.

I believe that there are thousands of pupils attending our schools and colleges who are incapable of attaining their greatest mental potentiality, or living up to the highest standards of morality, because their

motor energy is inhibited from the various channels of expression.

It is claimed on evidence resulting from experimentation in biological, physiological and psychopathological fields, that man possesses large stores of unused energy which the ordinary stimuli of life are unable to reach and even tend to inhibit; it is in unloosening these serious inhibitions through exercises, specifically given to arouse muscular electricity which will release the pent-up reserve energies by switching them into the diseased portions of the body and brain, that has proven a remedy for many disorders.

According to certain physiologists, a nerve has besides the power of conducting a stimulus received by it, the further power of reenforcing that stimulus, which they call the nervous avalanche.

In training persons suffering from extreme physical torpidity, I noticed a sudden awakening of energy, in response to certain exercises, and I believe that this demon-

strates that if the nerves have the power of amplifying the stimuli which is conveyed to the muscle, this same wonderful power can be made almost creative in its genius for coherent expression.

It is true that the muscles increase in size and strength by exercise, but it is also true that when muscles are too continuously or too vigorously exercised, particularly upon the same movement, the muscles rebel by pain and finally by wasting.

We must get away from the antiquated idea of developing large muscles; this is a very erroneous notion which has come down to us from primitive times. Among men in the earlier days, to discover the greatest man, the measuring string was placed around the muscle; that was the age of Hercules. Then came the time when the measuring string was placed around the head; that was the age of Bacon and Shakespeare. But the time will come in the rapidly advancing future when the measuring string will be placed around the heart, and he who meas-

ures most there will be most conformed to the Master, for he is greatest who most fully gives himself for others. The time for huge muscles has long since past; within the last few years scientists have been thoroughly investigating the effects of violent athletics. As I have previously stated, muscle was once important, in barbaric times, now it is unimportant and we know when too highly developed, it is actually harmful. All the evidence proves that the athlete has not so good a chance for long life as the delicate student and as a rule, the student outlives the gymnast, athlete or pugilist.

When the strongest man was the ruler of other men, when muscle meant protection from starvation, when muscle did the work that machinery now does, muscle was important. Today the less muscle you have, the better, provided you have healthy muscle and healthy blood. We have only a certain amount of vitality in our bodies; all muscle takes up its share of vitality, and leaves that much less for the brain and the

heart. We should not exercise to increase the size of our muscles, but just enough to keep our muscles and entire system in good condition. The successful people of today owe their success to their brains and not to their muscles.

The draft horse type of man is going, and the race horse type is coming in.

The ancient victories of the world were won by huge Norsemen Vikings, great terrible men with hairy chests and enormous muscles—yet a little round-shouldered man like Harriman can have fifty thousand of the old Viking type working on his railroad, each paying him a good share of his earnings.

Exercise is extremely beneficial because of three things:

1. It promotes circulation.
2. It causes the lungs to work, to take more oxygen.
3. It causes perspiration, which purifies the body and relieves the kidneys by doing part of their work, and also aids all the or-

gans in the performance of their functions.

If scientifically devised exercises are given, they cause an increase in the structural elements of the brain centers. Every inch that you add to your biceps or the calf of your leg, over and above what is necessary to keep you healthy and active, does just that much harm to your brain.

The trend of the day is toward the more powerful brain, and the smaller muscle. The thin, wiry, nervous body is ideal from the standpoint of art and usefulness, so cease thinking of the size of your muscle; use your brain intelligently. Thought is a functioning of the brain; add an inch if you can to the circumference of your head; thinking really does that.

So in my schools special care has always been given the important problem of "muscular dosage." A specialist in prescribing exercise must always take into account the muscular education of the person; especially is this of the gravest importance in the schoolroom where there are always abnor-

mal conditions present which must be treated with specific exercises.

I should advise teachers to watch carefully the fatigue of the individual, as no sharp line can be drawn between what is normal and what is pathological in fatigue, for what is normal for one person, may be pathological for another.

In giving the balancing exercises to a pupil, or in taking the balancing exercises, be careful not to overfatigue. If the person has been standing with the weight on the back leg muscles, the strain of bringing the weight on the muscles of the front leg will be severe at first, but usually disappears within a month of training.

The work of the ordinary gymnasium takes no cognizance of the vast differences in individuals, and I find large numbers who need much personal prescription. Most of the boys and girls in our schools, especially those who have grown rapidly, need special leg exercises; they also need exercises which will almost instantly compel a "sense"

of balance. Stand with weight of body on right foot, right side relaxed, right arm extended at right side; hold until you feel a sense of discomfort in right hip area, then bring the right arm forward toward the front at an angle of forty-five degrees from the first position, holding it in a diagonal line, and you will soon feel distress of position descend to the knee joints; then bring right arm directly in front of the body at full length and you will soon feel the sense of distress in the ankle joint. These movements require great concentration to "feel" the play and discriminate the movements in the different muscle groups involved.

To acquire the power of doing all these exercises with consciousness and volition, mentalizes the body, gives control over to the higher brain processes, and develops them by restricting their activities from the influence of lower centers. Then follow many exercises which require great alertness of attention in order to translate instantly, by imitation or verbal command, into an

act. With such movements, every untrained automatism, and every striated muscle, is made capable of direct muscular control, and must always be dominated by the will. Such movements and intricate exercises develop the motor centers and open up one of the main roads to the brain.

To know that we are strengthening and developing some point in a child, where heredity has left him weak, is a most inspiring thought. To keep the switchboard action of the brain in a bright, normal, active condition is something worth striving for. The brain unorganized by training, has, to use a well worn aphorism, saltpetre, sulphur and charcoal, or all the ingredients of gunpowder, but never makes a grain of it because they never combine.

Brain localization teaches us, that the motor centers are closely related to the psychic. The highest mental centers can be demonstrated to have direct connection with the lower motor, and trophic centers. Every center can now be proved to have

strands of association fibres to every other center, and every center acts on its organ, or is reacted on in turn; accordingly, we know that it is not the brain alone, but the whole body that is the true organ of the mind, and that as the motor centers are aroused and stimulated into activity, many dormant psychic centers can be awakened and developed.

It is related of Julius Cæsar, that he could dictate, write, plan and carry on a conversation, all at the same time, and that Dr. S. Weir Mitchell, besides being a physician, is a scientist, novelist, poet, historian, critic, lecturer, connoisseur, and a man of affairs. I must repeat what I said in a previous chapter, we must cultivate variability of movement. Beware of fixed habits, fixed manners. Man is largely a creature of habit, and many of his activities are more or less automatic. This I feel, is one of the chief causes of premature old age.

In my schools, my one aim is to develop individuality, so every effort has been to

train variability of bodily movement, also a great variety of color in the speaking voice. Down in the heart and soul of every one of us, God has put a grain of individuality, a germ of "difference" from all the rest of creation. Let us begin to develop this precious gift in our schools. Individuality is the essence of the human being.

The great tragedy of childhood is that its personality has been warped and perverted from infancy up. Life is for the individual, and while the ostensible object of education is the training of a person for this or that vocation in life, the real end and the only end that has any ultimate value, is the culture of character in the individual.

To quote Boris Sidis of Harvard College in his criticism of our schools, "They stifle talent, they stupefy the intellect, they paralyze the will, they suppress genius, they benumb the faculties of our children."

The aim of life should be to strive for the full use of our powers. The endeavor of ideal government is to secure this opportu-

nity for everyone. Education is the fitting of our children to have the full use of their powers, and when we insist upon getting these things recognized as fundamental facts, the rest will follow and we shall have a bedrock of common sense in education.

The school textbooks contain a great deal of irrelevant material, they seldom have practical application, they are overloaded with mathematics, theory, history, and the whims and fancies of authors. This sort of peptonized education has developed the idea, that to be a cultured and lettered person, means to have a smattering knowledge of many subjects, with no obligation to know any one thing thoroughly.

Listen for a moment to the words of Horace Mann:

“At college I was taught the motion of the heavenly bodies, as if their keeping in their orbits depended upon my knowing them, while I was in profound ignorance of the laws of my own body. The rest of my life was, in consequence, one long battle with exhausted energies.”

And this from the lips of a scholar, the President of Antioch College, to whom is due the founding of normal schools in the United States.

Mr. John Dewey in speaking of the isolation of school from life says, "When I was in the city of Moline a few years ago, the Superintendent told me that they found children every year who were surprised to learn that the Mississippi River in the text book had anything to do with the stream of water flowing past their homes, etc.; the geography being simply a matter of the schoolroom, it was more or less of an awakening to many children to find that the whole thing is nothing more than a formal statement of fact. Also he tells us that the subject of compound business partnership is probably not in many of the arithmetics nowadays, though it was there not a generation ago, for the makers of books said that if they left out anything, they could not sell their books. This compound business partnership originated as far back as the

sixteenth century; later the joint stock company was invented, compound partnership disappeared, but the problems relating to it, stayed in the arithmetics for two hundred years. They were kept after they had ceased to have practical utility, for the sake of mental discipline—"they were such hard problems, you know," and so the atrocious fatal sandpapering process of our children's brains goes on from day to day, and their precious young minds are sacrificed to antiquated traditions of education, because the pedagogues are asleep in their academic seclusion, instead of being at work in the great laboratory of Life—the Schoolroom.

The time is opportune to establish in the world a new idea of culture, the former culture of the mind was static, and is symbolized by the scholar's passively acquiring knowledge in a library. The culture of the twentieth century is dynamic, and is typified by men and women of affairs using their lives in holy service to uplift humanity. When we consider the ignorant, wrong,

cruel and unjust methods which have prevailed since the beginning of history in the education of the young, added to the cramming and stuffing methods, and the pell-mell manner in which children are flung together, it is a matter of amazement that so many good men and women have blessed the world.

The question may be well asked here how it happened that America produced so many men of remarkable intellect, with such slight opportunities of education in former times, while our greatly improved universities have not graduated an orator like Webster, a poet like Longfellow, or a prose writer equal to Hawthorne, during the last forty years. There have been few enough who have risen above mediocrity. It must be confessed, with a special cause for humiliation, that we have not in art, literature and science, produced any man who measures up to the level of Raphael, Shakespeare and Darwin, for they have no equals in the whole human family.

It was a tremendous gain for the child of the twentieth century, when psychologists turned their attention away from metaphysical abstractions and devoted their time and study to the general physiology of the nervous system. Many of these discoveries, however, have been made within the last few years, and on that account they are scarcely known to the general public; they indicate, however, a revolution in educational methods for the betterment of the human race, and we are led to consider as quite probable Nietzsche's conviction—"that man as he now is, is only a bridge, only a transition, between the animal and the superman."

We point with pride to the tremendous advance which occurred, between the hypothetical speechless man of the tertiary epoch, and the man of the diluvial period, endowed with speech, who used fire and tools; then from this to the barbarians of the later stone age, who cultivated fields and tamed animals; then on through the dawning of

culture, through the bronze and iron ages to the civilized races of ancient and modern times; truly a tremendous intellectual advance, and now the educational horizon is agleam with a light which shall lead us on to greater height of intellectual and physical perfection.

We cannot think that man today is the end product of intellectual development; he is only the beginning of a new developmental process in which the brain will attain still further supremacy over the body, and in the dim procession of years, the future product will be a being of whose structure we can form no adequate conception. Perhaps the actual "superman" whom Nietzsche evolved as the result of the continued progress of development.

The pioneers in the new educational movement must see that the schoolrooms are life laboratories, for making over human character as well as human bodies, for as Horace Mann says, "one former is worth one hundred reformers." It is time now with

the new knowledge at hand for psychologists to turn their backs on psychological subtleties, and go to work in a life of holy uplift and service.

To sum up briefly, the secret of opening up the Main Road to the Brain, is perfect concentration upon each movement outlined in this course especially the exercises for Balance.

Each movement for the various balancing exercises calls forth an effort, or rapid succession of efforts, the mind directing each movement; especially is this true where the balancing exercise is held for a minute.

It is not enough for the teacher merely to state what she would like to have the pupils do, since in the majority of cases, the pupil has not the Will power, nor strength of mind, to drive his body to the point which can be called exercise. The teacher must have the art to create the desire for physical perfection.

Then again, there is the rare exception, the pupil who will go about it too energet-

ically, for unless the body has been carefully trained to a point where it is equal to the demands put upon it, much harm may be done. Scientists are hard at work studying the cause of fatigue.

Fatigue may be carried so far, it is claimed, that recovery from it is difficult, and in the exercised muscle, a few minutes of rest, allow for a certain amount of recuperation, due to the taking up of fresh oxygen.

Sleep is of value because it makes rest more complete, and this allows the elimination to a further extent, of fatigue substance, and restoration of those things that are essential to further activity.

An important question in the problem is how much food, rest and sleep are required for healthful recuperation. Fletcher, Chittenden and others say, that overeating, is one of the chief causes of overfatigue. They say that a superfluity of foodstuffs within the body, leads to an accumulation of metabolic products, which in themselves act on the tissues, as fatigue substances.

The matter of quantity differs with every individual, the same amount cannot be prescribed successfully for any two persons.

I have made a thorough investigation of Fatigue in the schoolroom and I believe it is mainly due to three causes, poor ventilation, insufficient exercise, and autointoxication.

Besides the purely physiological and psychological aspects of fatigue, it has an important relation to many sociological problems. It is one of the chief causes of disease, crime, poverty and misery.

A scientist has recently estimated the minimum annual cost of serious illness in the United States. He says: "The economic waste from undue fatigue is probably much greater than the waste from all serious illnesses. Fatigue must be reckoned with in all human activities, and its toll must be rigidly paid."

The teachers in giving exercises, should look carefully to the conservation of energy by eradicating all awkward movements; a

pupil unskilled in the exercise he is doing expends two or three times the necessary amount of force.

It is necessary to have personal experience of bodily exercise to estimate the economy of effort which results from a well co-ordinated movement.

Coordination of movement is perfected by exercise. Train the body to obey the mind promptly. Physical exercises that are taken without the direction of the mind are usually awkward and clumsy.

Each pupil should be thoroughly taught the fundamental movements of perfect poise—of walking, running, jumping, rising and sitting down, going up and down stairs, and of the bow.

These simple movements are the very basis of grace, they give exercise to the mind, they also give the mind a better knowledge of the mechanism of the body in which it lives, and upon which it must depend for its own good health and activity, for from the body must generate the nervous energy

that causes the mind to do things worth doing.

Such training develops complete coordination of mind and muscle and is therefore the great factor in opening up the Main Road to the Brain.

THE CRYING EVIL OF COLLEGE ATHLETICS

CHAPTER IV

The Crying Evil of College Athletics

In order that we may fully realize the useless and dangerous methods of our College and University Athletics, it is necessary to go back to the practices of the ancient Greeks in the Sixth Century before Christ.

That remarkable century was the age of organized athletics in Greece. The rise of Sparta, and her success in sport and war, gave to the Greek world an object lesson in the value of systematic training. Thenceforth the training of the body was an essential part of Greek education.

Palæstræ and gymnasia were established so universally that Solon found it necessary to lay down laws for their conduct. An art of training sprang up, and in the time of Pindar the professors of the new science received honors scarcely inferior to those of the victors themselves. All classes caught

the athletic spirit. Later, competition raised the standards of athletics, when all the states of Greece joined in the sports. One state alone, Sparta, held aloof from the new athletics and competitions.

In Sparta, the main object of physical training was to produce a race of hardy soldiers, and hence the new science which aimed at producing athletes could find no place there. No Spartan was allowed to employ a trainer in wrestling.

Boxing was said to have been introduced by the Spartans. But though they recognized the value of boxing as a sport, they fully realized the dangers of it, from the competitive point of view, and therefore forbade their citizens to take part in boxing contests or in the pankraton, on the ground that it was a disgrace for a Spartan to acknowledge defeat.

We know now, however, that the Spartans and Xenophanes were right.

Wrestling is, perhaps, the oldest and most universal of all the sports, yet despite our

modern athleticism, it is certain that no other nation has ever produced so high an average of physical development as the Greeks in this period. This result was due largely to the athletic ideal which found its highest expression in the athletic poetry and art of the fifth century. This beautiful ideal is unique in the history of the world, nor are the circumstances, which produced it, ever likely to occur again. It was due in the first place to the early connection of athletics with religion.

The Greek games were established in honor of the Gods; exercise was made a form of praise to the Gods and the ideals of religion were invoked, that the soul might have a finer regenerated organism, with which to serve the Creator. And in those far distant centuries before the Christian era, we find that the young men held self-control, chastity, and temperance as the absolute price of manhood; a sad commentary upon the athletics of the twentieth century!

Without athletics, Greek art can scarcely

be conceived. The skill of the Greek artist in representing the form of the naked body resulted in the first instance from the habit of complete nudity in athletic exercises, a habit which Thucydides says was almost universal in the palæstra of the sixth century. It is interesting to note that there also arose in the same century, a demand for athletic statues, and that the early artists endeavored to express trained strength, by the careful treatment of the muscles of the body, especially those of the chest and abdomen.

The wall paintings of Beni-Hassan show that almost every hold, or throw, known to modern wrestlers, was known to the Egyptians twenty-five thousand years before our era.

To the Greeks, wrestling was a science and an art. Theseus, the reputed discoverer of scientific wrestling, is said to have learned the rules from Athena herself. Very great importance was attached to grace and skill. It was not sufficient to throw an opponent. He must be thrown

correctly and gracefully. Hence even when athletics had become corrupted by professionalism, wrestling remained free for the most part, from that brutality, which had so often brought discredit on one of the noblest of sports.

The method of instruction was strictly progressive. The different movements, grips, and throws, were taught as separate figures, the simpler movements first, then the more complicated.

It is somewhat of a surprise, to learn from this brief review of ancient Greek ideas concerning athletics that the ideals of antiquity, stood higher than those of the present day. Lycurgus' laws made compulsory the physical development of woman. Her development was watched over as well as that of the man, and we learn that Judaism stood higher still in its attitude toward the seriousness of procreation. These deep convictions of the ancients expressed themselves in the strictest hygienic legislation known to history.

All competition has a false ethical basis. Competitive athletics are a serious bar to general, all-around physical development. They concentrate interest upon competitive success, instead of individual superiority.

College athletics are a blot upon our educational system. The wealth of college associations is expended for the training of a dozen or a score of picked men; the rank and file, those most in need of exercise and bodily training are expected, from loyalty to the institution, to crowd the bleachers and root for the success of their team. College athletics are too often regarded as advertising media rather than for the benefit they should afford the entire student body.

The college athletics for girls present a subject for the gravest consideration; their great need is serious revision, and the elimination of many of their games. Hockey is unsuitable for growing girls. It entails violent exercise on two days a week, when the girls are exhausted with brain work. It is always noticeable on the day following

a college match, that the girls are listless, inattentive and lethargic. The characteristic stoop, the slovenly gait, the ungainly appearance of the average hockey girl, all are due to the fact that the player has to adopt a stooping, one-sided position, which directly encourages round shoulders, spinal curvature, school dyspepsia, school headaches, nerve and habit spasms.

Without going into further details of the unjust and dangerous methods of our college athletics, it will suffice to close the remarks with a quotation from Colonel Larned's interview in the *Literary Digest* of September 5, 1898:

"Of 314 young men examined for entrance to West Point, 82 were rejected on physical examination, and 18 were placed on probation making a total of 100 physically defective.

"That 30 per cent of these lads were physically unfit, is perhaps the most serious feature of the grawsome exhibit. That 314 youths, nearly all trained in our costly pub-

lic schools, with an average of almost 10 years attendance, supplemented in the case of one-third of their number by private schooling and in the case of 43 per cent by college training, should show 84 per cent of failure and various other deficiencies, is surely a state of affairs, that should make the judicious grieve, and our educators wake up."

Colonel Larned's interview concluded with this criticism: "That 30 per cent of physical deficiency, in our youth, is a condition of our civilization, which may well give concern more especially in view of the increasing tendency of population to urban centers.

"What are we going to do about it?

"Does education have anything to do with it? And if so what does an education amount to that shows this percentage of deficiency in its output?

"If Education is concerned with mental development alone, it is fair to ask, if 16,596,503 boys and girls taught in our schools,

at a cost of \$376,996,472 average no better in intellectual attainments than is evidenced by the foregoing, does the result justify the outlay, and the ten or more years apprenticeship of youth it demands?"

Let us look for a moment at the anti-physiological methods which prevail in our army. In the Army men are placed in ranks, according to their height, and it would seem natural enough that men of the same height should take steps of the same length. That is an erroneous estimation because the step is regulated by the length of the leg, and among men of the same height we find some with long trunks and short legs, so if men are placed in ranks according to height, their march must be out of step.

The Director of the higher branches of Anthropology, in the Institute of France urged the government to substitute for the present classification by height, classification by length of leg. Such a classification would have the effect of avoiding unneces-

sary fatigue. But it is not likely that a new form of classification will be accepted by the government. A regiment classified by length of leg would not present a very handsome appearance. Some men would be considerably taller than their neighbors, and the ranks would be of very irregular height. The æsthetic plays an important part in all bodies given to public parades. It is probable that personal pride will outweigh psychological as well as physiological requirements.

The æsthetic should play an important part in physical education, because the expressional movements give an impetus to the individual rhythm.

There is an infinite satisfaction in beginning early in life to cultivate our finer qualities, to develop finer sentiments, purer tastes, more delicate feelings, and the love of the beautiful in all its varied forms of expression.

There can be no greater investment than the cultivation of a desire for expression; it

will bring rainbow hues, and enduring joys to the whole life. It will not only greatly increase one's capacity for happiness, but it will also add greatly to one's efficiency.

Character is developed largely through the eye and ear. The thousand voices in nature of bird and insect and brook, the sighing of the wind through the trees, the perfume of flower and meadow, the myriad tints in earth and sky, in ocean and forest, mountain and hill, are just as necessary, for the development of a real man, as the education he receives in our colleges.

We read in the life of Darwin, that once while standing in the midst of the grandeur of a Brazilian forest he was so much impressed that he wrote in his Journal:

“It is not possible to give an adequate idea of the higher feelings of wonder, admiration and devotion which fill and elevate the soul. I well remember my conviction that there is more in man than the mere breath of his body.”

A love for the beautiful has a refining,

softening and enriching influence upon the character, which nothing else can accomplish. It is most unfortunate for a child to be brought up in an atmosphere in which it is missing, and where only a merely loving spirit is manifested, and where he is trained to think that the most important thing in life is to secure more money, more houses, more land, instead of more nobility, more sweetness, more beauty. The life that would be made complete, that would be sweet and sane, as well as strong and rich, must be ornamented, softened and enriched by a love of the beautiful.

There is a great lack in the make-up of any person who has no appreciation of beauty, who does not thrill before a great picture or an entrancing sunset, or a glimpse of beauty in nature. The love of beauty is a very important element in the poised symmetrical life. We little realize how every beautiful picture, every wonderful sunset and bit of landscape, every beautiful form and flower, beauty in any form wherever we

encounter it, ennobles and elevates character. We gain wonderfully in every way, by keeping the soul and mind responsive to beauty. It is a great refresher, recuperator, life-giver and health-promoter. Just in proportion to your love for the beautiful, will you acquire its charms, and develop its graces. The beauty thought and the beauty ideal will stamp themselves in the face and manner. If you are in love with beauty, you will be an artist instead of an artisan.

Parents should never lose an opportunity of letting their boys and girls see beautiful works of art, and hear the best music. They should make a practice of reading to them, or having them read very often, some lofty poem, or inspirational passages from some great writer, that will fill their minds with thoughts of beauty. The highest beauty, which is far superior to mere regularity of feature or form, is within reach of everybody; that of heart beauty, soul beauty. It is as essential to cultivate the æsthetic fac-

ulties, and the heart qualities, as to cultivate what we call the intellect.

The time will come when our children will be taught both at home and in school to consider beauty as a most precious gift, which must be preserved in purity, sweetness and cleanliness, and regarded as a divine instrument of education. All culture intensifies and refines the personality. There is no investment which will give such sweet returns as the culture of the finer self, the development of the sense of the beautiful, the sublime and the true.

For years I have noticed the awakening of the mind and soul in our young people in response to the expressional training of the body. It is well in the beginning to instil in the child's mind a desire for a beautiful, well poised strong body. It must be remembered that out of the Greek love for beautiful bodies and physical perfection grew all their arts.

One of the evil results that often attends the work in our college gymnasiums is the

muscle binding of many a promising athlete after a brief brilliant career as a muscular marvel. He is obliged to drop out of athletic events, and give place to younger and less experienced athletes, who will in time suffer from the same misfortune.

What is this condition known as muscle-bound? It is a serious affliction, and might with justice be called a malady. The muscles become larger and at first glance suggest tremendous power. But their real power is gone. The vital principle of elasticity is lacking. The most common cause of muscle binding is excessive training. The young athlete, trying to make a strong man of himself, does not stop when all physical indications point to the fact that he has had exercise enough for one day. He is training for endurance and believes that he is securing it by doing a great amount of heavy exercise in one bout. The muscles are sadly overtaxed. True, they grow larger, but at the expense of elasticity, without which muscle is of little value.

Our young athlete will proudly double his arm and show you great knots of muscle. The upper arm especially is bumpy, and swelling pads of muscles adorn his back. They are found in his upper leg and thighs, he is usually fond of excessive exercise. Watch him for a few years, and you will discover that he no longer takes pride in his condition. He has joined the ranks of the unwieldy "muscle-bound."

Now there is a phase of this unpleasant physical state that does not receive as much attention as it should. Muscle-binding often begins in the practice of feats that pull too heavily on the tissues. The result is a slight tearing of the muscle. It may feel stiff and sore, but not enough so to warn the young athlete that he should rest, and that he should exercise much more lightly when he resumes. Nature does her best to repair these slight tears and the result is a slight unbalancing of the injured muscles that in time works serious mischief. If the young athlete should tear one of the ligaments of

the leg so seriously that he could not move about except on crutches, he would accept the warning, but the muscle lesion goes unheeded.

The Indians and Japanese hold in contempt the muscle bound condition of the American athlete; declaring that the white man's muscle has no "brain" in it, whereas the Indians' and the Japanese' muscle is soft and flexible.

By this method of Scientific Body Building, however, no serious injury to muscles, tendons, or ligaments is involved; all these parts are strengthened by the work; each pupil is advised to employ far less than his full strength in performing the various feats, and while the exercises are to be executed with vim and celerity, it is never wise to use one's strength to the limit of physical exhaustion. Those who exercise thoroughly with a wise expenditure of strength will have sound and reliable muscles that will never become bound, and that in the moment of need or emergency will respond to

demands upon them, to their fullest power.

I find that many of the nervous diseases incident to school life, are due to an incorrect position of the body in walking, standing and sitting. Any pressure upon the spinal column is a serious menace to the very reservoir of life. To twist or crook the spine during study may cause disturbance just as electric wires if crossed and tangled raise the mischief. And yet, enter the class rooms of our schools and notice the very injurious positions of nearly all the pupils. Here indeed is the need of the most vital of all reforms.

Therefore, it is a lamentable waste of time, brain power, and energy, to compel children already fatigued to go through a useless series of merely mechanical exercises with dumb-bells and other nerve destroying apparatus, while the body is entirely out of adjustment, yet this is just what is occurring in our schools every day. To enter a gymnasium and see large classes of children, their eyes strained and their bodies rigid,

following the movements of a pair of dumb-bells in a teacher's hands, whose body is anything but correctly poised, is a sight to be deplored.

One of our most illustrious educators, G. Stanley Hall, declared years ago that all the apparatus work is distinctly antiphysiological, and yet this injurious method is still in use.

It is not at once clear to the mind that if this same amount of attention, given to counting the movements of dumb-bells, were directed to the form and improvement of their own bodies, a great saving of time and brain would result.

It is said that approximately one out of every ten boys in the United States lives in New York and the large cities immediately adjacent, and within the limits of Philadelphia, Boston, Chicago, and the other American cities, where the population exceeds a hundred thousand. The brains of these millions of boys are being forced to their extreme capacity whether they are taught in the school, the shop, or the street.

But alas! what is being done for their bodies? The answer may be had by standing at the door of almost any public or private school at the hour of dismissal. You will see large numbers of round-shouldered, narrow-chested, splay-footed boys and girls, also you will observe many who are suffering from curvature of the spine, and all this due to a lack of scientific training.

Let me indicate in a general way and without excessive detail, a method which will in all cases, even of strong hereditary tendencies, produce well formed, symmetrical and finely poised bodies.

The exercises must be taught progressively, at first the simple movements and positions separately, then combinations of these movements, which involve more exertion. Next the exercises for perfect poise, given in chapter two, which are to train the muscles of the back and spine, to hold the body easily erect, as in standing or walking. This is the first essential and must always be insisted upon; then great pains should be

taken with the sitting position, the hips should rest against the back of a chair, the small of the back as well as the hip and shoulders should touch it easily, gracefully "fitting" it, but not lolling. The hip joint is a hinge and we should lean forward from the hips in conversing, reading, sewing, or other work, keeping the chest and abdomen in normal relation, not allowing the body to sag at the waist, or double over at the shoulders.

Then the walk; walking is a fine art, but for the consideration of health alone, training in correct walking should be a part of the instruction in the daily work of the school. To walk well, one must have a well poised body and head. The length of the step should not be too short nor too long, but regulated by our height, and we must acquire a certain bodily rhythm, that gives to the walk an indefinable gracefulness, for any stiffness, or walking from the hips with the rest of the body immovable, is almost as ugly as walking with an excessive limberness.

Persons who turn their toes in, or turn one in and hold the other straight in front are extremely ungraceful in bearing. The rule is, subject to modification, of course, with reference to height, length of leg and breadth of person, that the toes of each foot should be turned out about two inches. Remember that breadth, as well as height, enters into the consideration.

The length of the step must be proportioned to the length of the leg. If the foot is thrown too far forward for the natural stride, when it reaches the ground it strikes with a jar on the end of the heel; this is the most prevalent way of walking, with the average person.

Children should be taught to stand correctly, feeling the weight on the balls of the feet. This will not only throw the shoulders and chin into proper position, but will adjust the internal organs and save them from the serious, but very common maladies of flat feet, or spinal curvature. Walking on the heels throws much of the weight of

the body upon the soft walls of the abdomen, and this is the reason we see so many persons who have what is called "high stomachs."

In walking, turn the toes out slightly and bring the weight upon the ball of the foot, pressing very lightly on the ball of each foot. Our laboratory workers have given us ample proof that all life, all activity, is emphatically rhythmic, and so to instil a sense of rhythm into a child's walk is a splendid mental, as well as a physical tonic.

There are a few simple points to remember in acquiring a graceful carriage. First, the body must be perfectly poised; all action must start from the hip joint, then one is prepared to take up the more difficult exercises.

Some pupils, because of natural weakness, will not be able at first to take up any of the severe work; these pupils should be kept upon the lighter work until the gradually improving physical condition makes it possible for them to take up the severe work,

by very slow degrees. The light forms of exercise will consist mainly of bending and swaying, also many phases of light exercises, which call for resistant muscle feats.

A very interesting and valuable form of exercise is the resistant "struggle." Here the pupils face each other and bend slightly forward. The opposing hands of the contestants are clasped with the fingers interlaced. At the start the hands should be on a level with the waist line, or slightly above. At the command "Start," the pupil who has been chosen as aggressor should push the other pupil across the room. The feet should be well apart, but the contestants will discover just how far apart it is necessary to have them. The "struggle" should be continued until the designated distance has been covered. Then after some deep breathing, the exercise should be repeated back to the starting point. This exercise is one that calls for strenuous work, and develops arms and wrists. The pupils will delight in varying this in many ways.

They can clasp right hands only, and repeat the "struggle," then left arms, only, and repeat. Then the right hand of one pupil should be opposed to the left hand of the other, and the push repeated, and vice versa.

The pupil must remember at all times that the right side should never be exercised at the expense of the left. In fact, in the beginning proper training should develop as much strength in the left side of the body as in the right. The form of this exercise may be varied in many other ways. Hands may be clasped over each other's heads, and the "struggle" may be employed. In this case the feet should be far apart, and the bodies of the pupils slanting toward each other. No parts of the bodies, except the hands, should touch. Then the pupils may bend over as close to the floor as they can go with comfort, and the feet a little more close together. With the hands clasped, as in the foregoing, they may struggle, but this will be found to be rather hard work.

A form of the exercise that is at first difficult for people of mature age, is found in the back-to-back "struggle." In this the two people stand with their shoulder blades touching each others'. The hands are extended sideways on a level with the shoulders. Each contestant clasps the other's hands, and the fingers are interlaced. Then with a slight backward inclination of the body of each, and with feet somewhat apart, the assailant pushes or pulls the victim across the floor. No part of the bodies below the shoulder blades should touch. The vital principle in these movements is the proper and emphatic resistance of one set of muscles by another. This may be accomplished best, of course, when there are two students working together, but there are many resistant exercises that may be performed by the student when he is obliged to work alone. This idea may be simply explained, if the student will clinch his fists, cross the inside of his wrists, and hold his hands at the right hip. Now let the hands move up-

ward towards the face, up over the head, and down to the left hip, and here is where the resistance comes in. The right wrist must force the left wrist up until the overhead position has been passed. The left wrist must resist by a downward pressure against the right; after the overhead position has been passed, the left wrist takes up the role of assailant until the left hip is reached; and so on through many varied and ever changing exercises, we proceed to the movements for training expression in the body, and I always find a general delight among the pupils in this work. We must remember never to monotonize the exercises. Variety and variability of movement is the keynote of this work.

We must teach rhythmical body movements to increase the power of expressing ourselves, and so restore the motor cells of expression, and I believe this variability of bodily movement increases the potentiality of brain centers. It also develops flexibility, sweetness and melody in the human voice.

As I have previously stated I know that certain nervous diseases are directly attributable to the excessive immobility of the individual. Mobility is the quality that distinguishes the higher from the lower forms of life, the mineral is inert, plants are rooted, only Man is free!

DEVELOPING THE WILL THROUGH
MOVEMENTS FOR MUSCULAR
CONTROL

CHAPTER V

Developing the Will Through Movements for Muscular Control

To build in this great city of the West "A Temple to the Will" has been a favorite dream of mine for the past few years. As yet it is only a castle in the air. This temple shall be mainly for children, all children, where they can play and learn through the training of body, voice and speech, the great gift of self-expression. A race like an individual takes its first steps in conscious power when it rises to self-expression. The supreme aim of all education should be to teach the child to express its own proper and special gifts.

The preparation of the young to meet temptation is of the first importance. The teaching of psychology is that every fall weakens to some extent the power of resistance, so, when education takes no cog-

nizance of the daily development of the will and moral character, and does not teach the destructive power of evil, it is lacking in its most essential requisite. Herbart fully realized this when he wrote his startling paradox "The stupid man cannot be virtuous."

Every physical process, movement, and exercise which requires cooperation of mind or muscle is not only a body builder, but a brain builder; even the ancient Greeks felt that knowledge for its own sake was dangerous, for what frees the mind, is disastrous if it does not give self control. Better ignorance than knowledge that does not develop the motor side; if in teaching a child, one can lead him to create something really his own, then you have opened up new vistas of brain development. Teach him to express first through the body, then through speech and voice; such training will open for the child, new channels of creative activities. It would unseal for him mental and moral avenues, otherwise forever closed, and have strengthened power and will; later when the

child feels the need of expressing himself, he finds he is able to do so, for he has quite unconsciously mastered the means of expression.

In taking the spinal exercises, especially those of the standing position, remember to get the position of perfect poise, then take the position of diagonal balance, inhale deeply, slowly, depress the spine, from the end, along its entire length, through to the base of the brain. If you start the balancing movement on the right foot, sway towards the left side; if you start the position for balancing on the left foot, sway towards the right side. The pupil must pay particular attention to the motion of the exercise, in twisting, bending, twirling and pivoting. This develops the muscles, the long dorsal muscles, that run over the convexity of the curvature of the spine.

The most striking function of the vertebral column is, of course, to support the trunk. The vertebræ in the cervical and lumbar regions serve as attachments for the

muscles. Incipient curvature as observed commonly in school children is caused by the spine being held in a stooping position too long at a time, until the mobility of the spine becomes restricted. It is possible to have a perfect standing position, and yet have an immobile spine. These special exercises train for mobility of spinal movements as well as for strengthening and developing the spinal muscles. Children need the daily training of all these muscles as well as their minds. I have evolved these movements, have tried and tested them over and over again, to find that they in all cases, even of arrested mental development, stimulate the nerves and brain centers, give mobility and celerity of movement, strength and suppleness to the whole body.

There is one form of disability closely connected with invalidism, the slow rate of development of the minds of many youths. The speed with which the intellectual capacities unfold themselves in different individuals varies greatly. The contrast be-

tween the precocity of Macaulay, Byron, Pope and Alexander Hamilton, and the condition of ordinary children, during the first ten years of their lives, is astounding. Along with the precocity exhibited by some children is found the phenomenon of retardation, in others in which the mind though of normal constitution develops slowly. Thus a well organized youth of sixteen years of age does not attain to the normal measure of intellectual development, until he is twenty-six, and on this account our general scheme of education and our whole system of judgment of youth is inapplicable to him, and this problem is the deplorable yet significant gap in our educational methods.

Some observation of the classes of Harvard University has led to the conclusion, that in one thousand men, the average departure in the rate of development is as much as a year or perhaps eighteen months, and that in that number of young men we can always find a score or more youths of what might be called average capacity, who

are as much as four years apart from their associates in mental power.

It is, therefore, painfully evident that these peculiarities of development should be recognized and made the basis of some readjustment in educational methods. It seems that there is a tendency in our nation to a slower rate of development than in earlier times, but there is also an increase of longevity and maintenance of vigor, the result of better hygienic conditions and more skilful medical treatment.

One of the most illustrious instances of the slow unfolding of the mind is that of Montaigne. He says when speaking of his childhood, "My health was good, my disposition was docile, I was notwithstanding so heavy, dull, and sleepy, that I could not be aroused from my indolence, even to play. My mind was slow and never moved, unless it was led. My understanding tardy, my invention idle, and amidst all an incredible want of memory." So we learn from a study of the many illustrious cases of ar-

rested mental development in youth, to bear patiently with the retarded processes of growth, for many years after the normal period. Also it has been noticed that in certain lines of descent, there is a tendency to irregularity in the period of development, and that this irregularity may manifest itself either in precocity or retardation of mental growth. But we must hasten to evolve a plan of readjustment to meet these new demands in education.

In exercises for producing mobility of spinal movements it is always best to begin with one of the balancing movements. If these important spinal muscles lose their normal irritability through immobility and rigidity, they respond more slowly to the stimuli of the will, and all the functions begin to languish and the organism becomes weaker.

Statistics show that one out of every three of our young women leaving college, has some deviation of the spine, and there is also a large percentage who are flat-footed.

These appalling facts should make us abolish the present antiquated methods, revise the entire gymnastic curricula and see that trained specialists are placed in charge of our schools.

It is of the greatest importance that these deviations be discovered and treated as early as possible. A spinal curvature can easily be detected by looking at the naked backs of the children. A thorough and rigid inspection of the spines of the children should be made in all the schools from time to time, and if all the useless dumb-bells and other "dumb" apparatus were thrown into the scrap heap, and a thorough training given in expression and a graceful carriage of the body, such training would save the brain waste now taking place, because of the present method of an outworn and antiquated system.

I have evolved a series of exercises for children from infancy to the kindergarten. Of especial importance in the kindergarten, is one that develops the lower limbs, and is

especially good for strengthening the articulation of the knees in weak children. Place the child flat on the back close to wall, so that the feet can touch the wall, then the teacher should see that the body is in a position rather close to the wall with the feet upraised and high in the air; place the feet against the wall, and have him push first with one foot, then with the other. The teacher should hold the shoulders of the child, so that there will be a decided resistance; in this way the spine and knees are strengthened.

Also the teacher or parent may take hold of the feet and push gently but firmly, first one, and then the other, telling the child to resist as much as possible. It is truly remarkable how rapidly incipient spinal curvatures yield to the various specific movements.

As Director of the Dramatic Art Department of many of our schools, I insisted upon a thorough and artistic training of the body preparatory to the dramatic training. As a

result, I noticed that the pupils were able to finish their work in half the usual period of time, that many of the physical disorders disappeared, and that the improvement in poise, carriage, voice and speech was indeed remarkable.

A young girl of about seventeen years attracted my attention. She seemed to have no neck, wore double vision glasses, and had a marked deviation of the spine. She entered a class for voice training and was suffering from obesity. Upon removing her collar I saw she had been wearing an aluminum band around her neck. Someone had prescribed this for lengthening her neck. She also wore the scoliosis corset. I refused to accept her as a pupil unless she removed the corset and the aluminum appliance for the neck. In her case I could see at once, that the spinal deviation could be cured by specific training of the muscles of the spine. Within six months the slight deviation which was of muscular origin, had disappeared. This young girl was dwarfed and

crippled in her activities by wearing braces that were unnecessary. Many young girls who have come to me for special training had been wearing orthopedic apparatus to immobilize the spine. Others also have been confined in bed, for weeks and months; in most of the cases after the apparatus had been removed, and specific movements given to develop the muscles on the opposite side of the curvature, the slight deviation was cured. The above case is only one of hundreds of cases that have come under my attention in the schools where I have directed the work. It is a hint in the direction of specific training for the home and school. Any apparatus that cripples the free movements of the body, any appliance to immobilize the spine, unless it be for diseases of the spine, will cripple and dwarf the child.

I feel that two-thirds of the cases of spinal curvature can be cured by specific exercises for straightening and strengthening the spine. We should watch the poise of the

head carefully, the head must balance on the cervical vertebræ, and not call upon the muscles of the neck to keep it from rolling off. These vertebræ in the cervical and lumbar region serve as attachments for the muscles. Any diminished mobility in the spinal column should be treated immediately.

On many occasions it is of importance to have a number of free standing movements, which can be taken either in the gymnasium, at school or at home. A physician often gives this prescription: "Take more Exercise," but when the patient asks what manner of exercise, the answer is generally, "Walk, Ride, or Drive."

Walks in the fresh air should always be prescribed and never neglected, but the benefit produced is somewhat restricted. The movements given here, and in the chapter on posture work, give the most comprehensive series of exercises, and in this respect, cannot be replaced by anything else. These movements are so chosen that they

can easily be taken and enjoyed by persons of all ages. A few of them have already been described. Some of them can at first only with difficulty be performed by children, and perhaps also by older persons who are quite unaccustomed to physical exercises, so that in this case these movements can be omitted to be gradually inserted afterward. The first essential before beginning are a few deep inhalations, and a perfect standing position. Fifteen or twenty minutes a day is often sufficient for this work.

The close standing position arises from the Fundamental Standing Position by closing the feet so that they touch each other on the inner sides all along their length. After this position is taken, sway forward from the ankle as far as possible, hold and rise on the balls of the feet.

The toe standing position arises from the Fundamental Standing Position by raising the body so that its weight rests entirely on the balls of the feet, but taking care that

the heels touch each other all the time.

The knee bend standing position arises from the Fundamental Position by bending the legs at right angles in the knee joints, in doing which, the knees are carried outward and forward, in the direction of the feet.

These exercises are a remedy for weak ankles. Many people who complain of weak ankles, are slovenly walkers who do not know how to use the muscles that control the ankle such persons usually "turn" their ankles, even when walking on smooth ground, and in this way get sprains that lay them up for weeks. The strongest ankle is not strong enough to support the body, unless the muscles that control the ankle are employed. The trouble is that most people walk in a very careless manner, depending principally on the equilibrium of their bodies to keep them from falling, rather than the employment of the muscles of the body. They totter like feeble men, instead of walking with a springy, active step. Those who have had trouble with their

ankles should bear in mind that the muscles that support the ankle are probably strong enough, but they are not actively engaged while walking. In order to overcome this fault, one should when walking, keep his mind on the muscles of the foot, and try to cause them to act as much as possible. The practice of flat foot walking should be avoided, instead the foot should be given as much motion as possible when making a stride. If this be done, in due time an active, springy walk will become an unconscious habit, and the muscles will always be on the alert to keep the ankles from turning. The practice of wearing high heels does much to weaken the muscles of the ankle, the result being that finally the muscles become weak and what is still worse, fail to act at all, the natural consequence is that a person loses all control of the muscles of the ankle, just as most of us have lost control of the muscles of the ear.

In connection with this, let me state that it is dangerous to assist any muscle of the

body. The more a muscle is assisted, the weaker it gets and the less it responds to the motor nerves. If any part of the body is deformed, or has become weakened as the result of certain muscles failing to perform their duty, the muscles should be strengthened, not helped.

A movement well known as the knee upward bending is as follows: The left leg is quickly bent forward so that a right or even an acute angle is formed at the hip joint, but still keeping the lower leg in a vertical position, and with the foot at right angles to the lower leg, or else hanging down freely. A short pause is made before the left leg is placed on the floor, and the right one lifted, and so on, while the body as a whole is well balanced all the time.

Exercise for head flexion in the direction forward, backward, and to the sides, is an active movement in free standing gymnastics. In flexion forward and backward, remember that the movement takes place in the vertebral column of the neck.

Head side flexion generally called head lateral falling, should be done as a proper flexion without twisting. For stiffness of the muscles and joints of the neck, which often occurs in rheumatic affections, these movements are given as passive when the pupil is best fixed lying on his back, the flexion being performed without resistance. I wish to lay a special emphasis on these neck muscle movements.

A famous consulting ophthalmic surgeon, when consulted by an anxious mother in regard to her daughter's eyes, would often reply, "It is not your daughter's eyes that are affected, but the trouble is in her spine." This is often the case, and that four-fifths of the number of children who have come to me for physical education have been helped, not only of defects of vision, but also of defective hearing, and nervous and digestive disorders.

There are muscles between the head and trunk of the body, along the neck that are intimately associated with the base of the

skull, and are connected with the spinal column. To increase the functioning and mobility of these muscles, turn the head to the right as far as possible, and while holding it there, increase the tension of the muscles until they have been made rigid. Physical accomplishments bring their mental as well as physical equivalents, and should be considered part of the mental education of girls and boys.

Exercises which require a considerable number of conscious contractions of the muscles, followed by more or less complete relaxations, seem to contribute most to their general nutrition; also concentrating on the muscles which we wish to develop. A prominent Yale Professor demonstrated this by instructing a class of athletes to develop the right arm by physical exercise without mental concentration, and the left arm by physical exercise plus mental concentration on the muscles of that particular arm. In a given time the left arm was far stronger than the right.

To develop positive concentration, it is necessary to give movements that compel concentration. A difficult balancing movement invariably does this. Always in giving a new movement, first pose the position of the exercise without telling what particular muscle groups are involved. Then the pupils are to find out. The teacher should always ask questions in regard to the particular movement, in a class of beginners. If a movement is given which requires a brief rigidity of thigh or ankle muscles, there is usually but two or three pupils who can tell the specific muscles involved. However, at the end of the term each pupil's body has been so developed, so mentalized, that they can readily answer the questions.

To increase this mentalization of the body give a running series of exercises, which require conscious contractions so that in performing these movements they not only improve the quality and tone of bones and muscles, but they improve the health and strength of the entire system, including

stomach, brain, nerves, heart, lungs and pelvic organs, through the effects produced upon the respiration, circulation and digestion.

The more the living body works, the more resistant and the fitter for work it becomes. It is a law of vital movement, that function strengthens the organ.

I have chosen as a convincing illustration of a method of developing muscular control the case of the illustrious Sir Walter Scott: "At the age of eighteen months the eruption of his primary teeth was attended by considerable constitutional disturbance, including a high fever and paretic phenomena, resulting in exhaustion and lameness. In consequence of the lameness Scott was sent to the country and placed in charge of his grandfather, the shepherd of whom laid him beside the sheep. Scott, never reticent about his lameness, gave in an interesting autobiographic fragment the clinical history of his ailment: "I showed every sign of health and strength until I was about

eighteen months old. In the morning I was discovered to be affected with the fever that often accompanies the cutting of teeth, it held me three days. On the fourth when they went to bathe me, as usual, they discovered that I had lost the power of my right leg. There appeared to be no dis-coloration or sprain; blisters and other topical remedies were applied in vain. When the efforts of regular physicians had been exhausted without the slightest success my anxious parents, during the course of many years, eagerly grasped at every prospect of cure which was held out by Empirics, or ancient ladies or gentlemen who conceived themselves entitled to recommending various remedies, many of which were sufficiently singular."

When he was four years old he was sent to Bath, where for a year he went through all the usual discipline of the pump room and baths, but without the least advantage to his lameness. He was treated by the celebrated Eighteenth Century Electrical

Quack, Graham, who made a great parade of electrical appliances. Scott was not benefited in the least by the magnetic touch of the quack or by the electricity.

Scott's maternal grandfather, Dr. Ruth-
erford, professor of Medicine in the Univer-
sity of Edinburg, sent him into the country
to rough it and made efforts to call into ac-
tion, the affected muscles by the will. This
method consisted in placing bright objects
or things that the boy especially desired in
such a position that he could get them only
by the most powerful efforts in which the
affected member participated. By persist-
ent use of this plan of "natural exertion"
great gain resulted in will power over the
muscles. They increased in size and range
of action. The limb ultimately became
quite useful, although always lame. This
method of dominating the paralyzed and
wasted muscles, by the forcible action of the
will is possible only in cases in which vol-
untary control is still preserved. Some re-
sponse to the will may be present when the

faradic or interrupted galvanic currents have no longer any power to execute muscular contraction. That this was the case with Scott is shown by the results of the method of "natural exertion." This method is invaluable in all similar cases.

CULTIVATION OF THE WILL

CHAPTER VI

Cultivation of the Will

The world's greatest scientist, Elié Metch-
nekoff, tells us in his "Disharmonies of
Man," that the will is the last of the human
faculties to be developed; that the elemen-
tary instincts, inclinations and desires are
developed extremely strong in youth, an
appalling thought for us all!

The educators of today must seek the key
to this sad tragic puzzle, and try by every
means possible to solve this terrible "dis-
harmony."

I protest against the current methods of
teaching and studying ethics in our academic
institutions, as a speculative, historical, ab-
stract thing.

The human will is a current of force which
is to one's individual life, like the helm to a
ship. The basis of all education should be
the development of the will. The genesis

of morality is preeminently the genesis of the will; its education ought to be the reinforcement of the will.

The will develops its own activity, as it apprehends its own powers. The will is the man, quite as much as the intellect. The real elixir of life is not to be found in the stomach, but in the mind, in the will to live. The working tools are consciousness and will. With these alone you build the "Temple of Human Character."

Muscles are in a most intimate and peculiar sense the organs of the will, and I have found that by training flabby, weak muscles, the weak will is strengthened.

Huxley says: "That man has had a liberal education who has been so trained in youth that his body is the ready servant of his will, and does with ease and pleasure all the work that as a mechanism, it is capable of; whose intellect is a clear, cold, logic engine, with all its parts of equal strength, and in smooth working order, ready like a steam engine to be turned to

any kind of work, and spin the gossamers as well as forge the anchors of the mind; whose mind is stored with a knowledge of the great and fundamental truths of nature, and of the laws of her operations.

“One who, no stunted a scetic, is full of life and fire, but whose passions are trained, to come to heel by a vigorous will; the servant of a tender conscience, who has learned to love all beauty, whether of nature or of art, to hate all vileness, to respect others as himself.”

This is the education we should give to our youth, but I ask what have our schools done to train the body to be the ready servant of the will? I feel that it will take at least three or four generations of earnest devotion to bodily culture, to offset the mischief wrought by two generations spent in the ceaseless mental grind demanded by our schools and colleges.

The eminent Boris Sidis of Harvard University says, in his “Philistine and Genius,” “I assume that you realize that what is req-

uisite is not mere routine, not mere desiccated quasi-scientific college pseudagogics, and philistine normal school training, but more light on the problems of life; what you want is the education of genius. We regard the child's mind as a vacant lot, and empty on it all our rubbish and refuse. We labor under the delusion that stories and fairy tales, myths and deceptions about life and man, are good for the child's mind. Is it a wonder, on such a foundation, men can put up only shacks and shanties? Our schools only sterilize, petrify and embalm their minds, they are all pressed into one mould. The pedagogues have proved themselves incompetent to deal with the education of the young. They stifle talent, they stupefy the intellect, they paralyze the will, they suppress genius, they benumb the faculties of our children."

The purpose of this course on Scientific Body Building is to call especial attention to the development and perfection of the most wonderful Temple in the world,—“The

Human Body," an exquisite instrument, almost always neglected, and rarely ever tuned to the harmony of perfect health.

If the world were but to realize the necessity of physical salvation, we might hope again for a physical renaissance. Such a rebirth the world has seen but twice, or perhaps thrice, and each was followed immediately by the two or three of the brightest culture periods in history.

Modern psychology sees in muscles organs of expression for all efferent processes. Beyond their demonstrable functions, every change of attention, and of psychic state, plays upon them unconsciously, modifies their tension in subtle ways, so that they may be called organs of thought and feeling as well as of will.

Muscles are the vehicles of habituation, imitation, obedience, character, and even of manners and customs. The motor areas are closely related and largely identical with the psychic nature, and muscle culture develops brain centers as nothing else can.

Scientists now are urging that the motor education of the young should be made compulsory.

Skill, endurance and perseverance may be called muscular virtues. Fatigue, caprice, ennui, restlessness, lack of control and poise may be called muscular faults.

The revelations given us by discoveries in brain localization have thrown a new light upon the possibilities of muscle culture. The experimental research of scientists has resulted in a practical science of brain-building, by a systematic art of training, which causes an increase in the structural elements of the brain cells and whole nervous system. It would seem as if "to know thyself" scientifically, rather than metaphysically, instead of being the first was destined to be among the latest of human achievements.

The training, developing and strengthening of the will is the most important factor in school life, and yet the most vital, for the will is to the child or man, like the

iron spike which the sculptor puts in his statue; it impales and supports him. We begin with precise movements in balancing classes, then teach the various technical steps leading up to a graceful standing and sitting position, also reclining positions with which to show the relaxation in the body. It is really interesting how the children soon learn to love the expressional side of physical training. Then follow exercises for precise and coordinated movements of the various muscle groups; hence, children who are not trained from this standpoint grow up often faultily and imperfectly developed.

These exercises are true intellectual gymnastics and aid in stimulating the brain, just as the physical exercises strengthen the general health and quicken the growth of the body.

After the child has acquired a certain unconscious grace, separately prepared exercises are chosen to train and strengthen other muscular groups. I insist always upon concentration on the movement to be

executed. These psycho-physical expressional movements, open up the roads for a harmoniously balanced brain; but beyond everything else, he has attained a certain control of his body, and the pupil experiences and enjoys the spiritual awakening which results when the mind is the master, and the muscles of the body the servants.

The pupil has unconsciously acquired grace of movement and gesture, which makes his hands and his body more attractive and more responsive. Another marked result, is the refinement in the expression of face and bearing, which reveals the spirit taking command of the physical. Orderly, precise, coordinated movements, increase the child's nervous energy.

To deprive the muscles of action is to inhibit the natural motor impulse and force them into a state of atrophy. Will power, like all other activities, is invigorated and developed through methodical exercises, and all the exercises are chosen with regard to stimulating and invigorating the motor

centers; this trains the pupil to become his own master.

Any child or grown person will be interested in the illustration of the deltoid muscle as demonstrating the power of the will.

An ordinary muscular man can readily lift at arm's length a fifty pound weight, the arm being twenty inches long, and is a lever of the third class, that is with a sustaining fulcrum which in this case has its lifting attachment about an inch from the point of rest, at the shoulder joint, (so that to lift a fifty pound weight at the hand, being the long end of the lever), required a lifting force of one thousand pounds at the fulcrum, the point at which the muscle is attached.

It is evident then, that a muscle stimulated by vitality and controlled by the mind, has a lifting force of one thousand pounds, and this same muscle removed from the body, would not sustain a fifty pound weight, without being torn asunder. In the first case, it is living matter subject to will power, in the second case, it is dead matter, with only a cohesive power.

Parents and teachers would do well to cite this illustration to their pupils; the very thought of the power of the will on the muscle is stimulating to the young minds, and is also fertile with suggestions in many other ways.

The training of the body in its highest sense is to make of it an instrument of expression only for the use of the soul, to teach our youth that they can gather from triumphs over the body a new consciousness of the divinity of the spirit. The preparation of the young to meet temptation is of the first importance in education. Using the word "temptation" in its usual sinister sense, the main purpose of the training of character is to make the pupil "temptation-proof"; this it seems to me is the crux of the whole problem of Education, and I say from the weight of wide and varied experience, this can be done in scientific, physical education.

We educate children or adults by increasing their neuro-muscular control. It se-

cures for them grace and ease of motion, and adds to their mental power by placing the muscles under the control of the will.

Occasionally a man under some sudden impulse falls into a condition of extreme violence, and being unable to control himself, commits acts of which he repents immediately afterward. It is the custom to say that at such times the brute has awakened in the man, probably some nervous mechanism from a remote ancestor has come into action at the call of stimulation owing to the lack of proper development of the will. Unless the character is trained in childhood, youth is not prepared to cope with the coiled temptations of later years. The moral compass is disturbed and unsatisfactory. It is made untrue in an instant, as the magnetic needle of a ship is deflected when it passes near great mountains of iron ore.

It is well for a young boy to realize that life is not a palace car, with soft cushioned seats, where he has but to pay for his ticket

and some one else does all the rest. . He should not feel that he is a mere passenger, he is the engineer and the train is his Life.

The training of manual work, the keen discipline in learning any one of the skilled trades, is the schooling needed above all for the city boys, not only because it is going to make efficient men of them, but because it is also a necessity to their bodies. He must get concentration and effectiveness of work, and the will to overcome difficulties.

No teacher of wide and varied experience can have the hardihood to say that we talk too much nowadays about the social question. I feel that all the sad tragic loss could be avoided if boys and girls were educated for life, instead of for college entrance examinations. When once the sacred powers, now confined in the prison of perverted instincts, of unnecessary suffering, shall have been liberated, then not only the forces at present wasted, will serve to benefit all the rest of life, but also the great spiritual forces, will be dedicated to the service of humanity.

A mere accident of circumstance often condemns to criminal careers youths capable of the highest service to society, and for a brief season of temperamental outbreak, and obstreperousness, exposes them to all the infamy to which ignorant and cruel public opinion condemns all those who have once been detected on the wrong side of the invisible and arbitrary line of rectitude.

The heart of criminal psychology is here, and it is a stroke of irony from the very seat of education to persist in teaching ethics as a speculative historical abstract thing. Our attitude towards all the aberrations of life and conduct, described by such terms as immorality and crime, idiocy, imbecility and insanity, is being rapidly and radically changed. Lombroso was the first to emphasize the relations of all these abnormalities, and to point out their interconnections.

It is true that public opinion is not yet prepared to consider as mentally diseased individuals who are various types of perversion with intellectual resourcefulness, but

alienists should work against such misconceptions, and in the name of justice correct legal errors, where responsibility is recognized in individuals who are not responsible for their crimes.

Professor Way in his studies upon the physical condition of young criminals has found that in the majority of instances there appears to be some neural defect, mostly in the nature of depletion, which he believes contributes to alienate the moral feelings of the individual, proving that viciousness has a physiological basis, so that we may gather that the crime is very often due to neural pathology rather than to moral culpability.

Above all, these children are adolescent, they are in the most critical period of their lives, they are undergoing a new birth, they are throwing off the chrysalis of childhood, they are awakening to the things of the soul, to the infinite, and to open their souls to poetry. It is this period of adolescence, the marvel and mystery of which we are only

beginning to comprehend, which with proper education would contain the answer to some of our most perplexing questions, problems as yet only dimly realized.

A few experts in psychiatry say that muscular play is useful in many forms of insanity. I feel that an organism completely nourished not only in its brain work and muscles, but in the finest ramifications of its nervous system, would be but for morbid hereditary disposition, a well equilibrated organism. Every vice, which reduces to a disequilibration, thus reduces scientifically to the more or less incomplete nutrition of some deeply seated organ.

Young men and women trained to perfect muscular control, would realize in life that when personal happiness conflicts with any great human ideal, the right to claim such happiness is as nothing compared with the privilege of resigning it.

I regard the following exercises as extremely helpful in acquiring muscular control.

First, a correct standing position and complete relaxation, then bring the arms straight up and in front of the head, take a deep inhalation as you start the arms in outgoing circles, inhaling as you make the circle outward, exhaling as you complete the circle, and bring up to the starting position. Repeat this exercise slowly, rhythmically, concentrating on the inhalation and exhalation until you feel the expansion, contraction and relaxation of the muscles involved.

Extend right foot forward diagonally, knee slightly flexed, but firm, then let the torso dip down diagonally as far as comfortable, then suddenly twirl (as it were) the upper part of the body, from the hip joint, landing on the left foot.

Take the breathing exercise. This should always precede these balancing movements, reverse position of the body, standing on the left foot, then extend left arm in a diagonal position, hold the right foot up on a line with the waist line, then turn torso quickly to-

ward right side, landing on the right foot. This exercise I regard as a panacea for most of the nervous debilities incident to school life.

The wonderful performances given by acrobats and jugglers in vaudeville have always been regarded principally for the amusement they afforded, but since I realized the wonderful results of the various balancing exercises in my pupils, it has suggested to me the broader value in the work, also its almost unlimited possibilities. I feel that they will be used as a cure for such serious maladies as locomotor ataxia, and similar diseases involving the loss of control of muscles and nerves.

Medical men in this country and in Germany have very recently been following these acrobatic feats with the greatest interest. Representing as they do the utmost development of coordination between brain, nerves and muscles, they naturally suggest new methods of treatment in cases where lack of that coordination is the principal symptom.

The human nervous system is a good deal like a big telephone exchange, only infinitely more intricate. In a normal person, ideas are received through the brain, corresponding to the central exchange and the particular muscles, which the mind wishes to bring into action, are communicated with by means of the network of nerves, which cross and recross each other, through the tissues of the body, and correspond in a way to the telephone wires. If anything goes wrong with either the exchange, or the wires communicating with it, the whole system is deranged.

The big nervous trunk line of the human telephone system, is the spinal column; when this degenerates as it does, in cases of locomotor ataxia, and similar diseases, the human telephone system is put out of working order. A person suffering from locomotor ataxia, desiring to walk along a chalk line finds it impossible to do so. His mind forwards the message along the nervous telephone wires the same as a normal per-

son's, but somewhere in the spine the message goes awry, and the leg which was supposed to move forward, refuses to move, or perhaps moves sideways or backward.

One of the principal symptoms of locomotor ataxia, known as the "Branch-Rumberg Symptom," is the inability of the patient to maintain his equilibrium, when his eyes are closed. Stand him up against a wall, then tell him to close his eyes, and he will invariably sway and fall. Just as the person suffering from locomotor ataxia lacks equilibrium, so the trained acrobat excels in it. The latter's brain, nerves and other organs work in such complete accord or coordination, that he is able to accomplish feats, which would be utterly out of the question for the normal, but untrained man.

There are many exercises, which will follow in later sequence, which I believe, will establish new records of muscular and nervous coordination. It is a well known fact, that many of our famous neurologists are prescribing systematic exercises for the various nervous disorders.

Stand against a wall, take a deep inhalation, try and make as much of the spine as is possible touch the wall. Do this first with open eyes, then with closed eyes. Then stand with heels about three inches removed from the wall, bending slowly forward from hip joint, exhaling deeply, then slowly unfold to rising position, inhaling to rising movement.

I find that most deviations of the spine have a muscular source, and arise from a predominant action of the muscles, which draw the vertebræ in a given direction. In such cases I begin with exercises for creating mobility of bearing; training a consciousness of movement into the muscles and joints. Then I proceed with exercises that give a forced flexion of the dorsal part of the spine. In a short time the spine assumes a normal position, and many of the nerve defects soon disappear. I believe that we are just as young as our spines are supple.

The case of E. H. Harriman is still fresh in our minds, it was the principal topic of

medical circles of Vienna, not only on account of the prominence of the patient, but because of the peculiar phases of the disease. Cases of such extreme rigidity of the vertebral column are generally caused through rheumatic or chronic inflammation of the joints of the spine, or of the muscles surrounding them. The disease attacks the patient slowly, and it is generally some years before the whole vertebral column is rigid.

In arranging the physical balance sheet, so that the highest possible enhancement of life will be possible, it is necessary to first look well and carefully to the spine. In the foundation of our educational system are flaws which must be eliminated. It is time for us to realize that education does not simply mean to minister certain doses of writing, arithmetic, physics or history, but to educate man as a compound being, mind and body.

We must revise our school curriculum and especially in the Department of Physical

Training provide a more thorough and scientific training of the body, design a system of exercises that will give more scope to the comprehensive motor activities denied in the ordinary school curriculum.

The physical training must seek first the achievement of postural and corrective and recreative values, as well as training to quick and definite reactions. Growth, development, and functional activities are considered in their physiological relations, and from their training, health, mental and moral qualities result. As pride in personal appearance distinguishes cultivated people, it is the intention that other resultants shall be correct habits of bearing, carriage and poise in address. The day is long passed when physical development meant large muscles. The measure of the biceps is not the measure of the man.

One would infer from the physical culture advertisements, that the great desideratum of exercise, was to make a burly frame. Physical education should give one a superb

body, with not one overdeveloped or underdeveloped muscle. It should develop a beautiful, refined body, not refined in proportion only, but in presence and bearing it should do splendid work beneath the ribs, with the lungs, heart and stomach.

Nerve and brain measure more than muscle, the benefits of scientific training, and such training should put a man or woman into condition to do his best work to the full sense of buoyant life. Well developed muscles go a long way, of course, but the size of the muscle is not the measure of the brain. The big hulky dray horse is a stupid animal compared with the alert sinewy racer.

An educational system should have two objects, first to make a sound and healthy body; second, the development of the will and the formation of character through mental and moral discipline. The Greeks were wiser than we. They saw that the proper foundation for a healthy mind and mental training, was the training of the body.

The Greek ideals of beauty, thus developed the body only for the sake of the soul.

History tells us, that one-half of all their education was devoted to the body and Galton says, that they as much excelled us, as we do the African negro. They held, and I believe they were right, that if physical perfection was cultivated, moral and mental excellence would follow. I believe that the strongest nations of the future will be those which give the most intelligent care to the body, the best body implies the best brain. The Greeks could hardly conceive bodily apart from psychic education, and with them physical was for the sake of mental training.

As the Greek games were in honor of the gods, so now the body should be trained to better glorify God, and regimen, chastity, and temperance, are given a new impetus, a fore-gleam of how sweet the glory of achievement.

In studying the exercises of the ancient Greeks, I find that balance occupied the

most prominent place. Balance and breathing exercises. Does it now seem that the ancient Greeks thousands of years ago fore-knew something of present day scientific research, as to the specific relations of brain and muscle?

The Greeks considered the human body the dwelling place of the Divine Spirit. They did not work for extreme development, they worked for beauty of form and balance, and out of their love for the human body, grew their arts and they degenerated only, when they turned to gluttony.

The adoration of human nature by the Greeks appeared in plastic art and was the cause of its excellence. The ideal of art was to copy in the most faithful way the most perfect example of the human body, and Greek artists made measurements of the body so accurately that modern science has confirmed their chief results. As sculpture most completely realized the Greek ideal of the human body, it became almost a national art among the Greeks, and just as Greek

art aimed at the preservation of the body of man, so Greek philosophy proclaimed the nobility of all human qualities and inculcated the doctrine of a harmonious development of all sides of human nature.

Of all people that ever lived, the Greeks knew best what breath meant both in exercise and in battle, and therefore the Queen of the Air becomes to them the Queen of Bodily Strength. The Grecian poets have given us beautiful thoughts in regard to breathing, in fact, the literature of the most cultured nations teems with it. Note how Shakespeare expresses this thought in "As You Like It," where Orlando says:

"Yes! I beseech your grace
I am not well breathed."

Now this giving of strength by the air is mechanical as well as chemical, for you cannot strike a good blow, but with your chest full, and in hand-to-hand fighting it is not the muscle that fails first, it is the breath; the longest breathed will on the average be the victor, not the strongest.

This brief outline of the work of the ancient Greeks is a sad commentary on our educational system, for we have all along been working at the top and neglecting the foundation. In our strenuous preoccupation with the intellectual development, we have forgotten the body. Statistics show us that 75 per cent out of every hundred young women who enter the university have curvature of the spine, and 20 per cent are flat footed, and yet it is a well known fact to Body Building specialists that these defects are directly due to bad posture, both in standing and sitting, and can easily be cured by specific exercises.

The child who habitually leans backward on the heels, is degenerating physically as well as psychically. He reveals an immobility that is not conducive to change or development or expression, he is (strange as it may appear to the unthinking), undermining his will power, and creating, what is just as dangerous, an obstinate will, because there is no poise in the body. Whereas

the child who is trained to stand solidly on the foot, feeling the weight on the ball of the foot, with a reasonable flexibility of ankle movement, will always be more balanced mentally.

Leg exercises have a decided value in the development of will power, so always lay stress upon basal movements, as not only compensating, but because they are of high therapeutic value, against the disorders of the accessory system. It constitutes a fine cure for fidgets and tense states, and directly develops poise, control and psycho-physical equilibrium.

The finer and accessory muscles are those of the hand, tongue, lips, face and articulating organs. These also extend into a longer and diversified series, as those used in writing, talking and piano playing. They are represented by small and more numerous muscles where functions develop later in life, and represent a higher standard of evolution. It is these fine muscles that are so liable to disorder in the many automatisms

we see in school children, especially if excited or fatigued.

General paralysis usually begins in the higher levels. By breaking these down, so that the first symptom of its insidious and never interrupted progress is inability to execute the more exact and delicate movements of tongue, or hand or both. Starting with the latest evolutionary level, it is a devolution that may work downward, till most of the fundamental activities are lost before death.

It must be remembered that a child or man is the sum total of his movements or tendencies to move. Nature and heredity chiefly determine the basal and education, and culture decides the evolution and development of the finer and accessory parts of our activities.

The training of the entire accessory system is of vital importance, for the development of the individual as well as for the development of all the arts of expression. These smaller muscles might almost be

called organs of thought, their tension is modified with the faintest change of soul, such as is seen in accent, inflection, facial expression, handwriting, and many forms of so called mind-reading, which in fact is always muscle reading.

If you wish to double your child's inherent potentiality, cultivate variability. The training of variability is the most precious part of a fine education; especially is this true in physical education. Make the law in the classes that of exquisite grace and freedom. Mme. Bernhardt tells us that in the simple greeting of a good-morning, that there is not one way of saying it, but a thousand ways. Remember that in the very simple thing of the poise of the body, relaxation should express itself from every joint, and that rigidity like sclerosis, induration of tissue means decay of originality and expression.

In the simple task of the schoolroom, muscle control should be insisted upon during the writing period, the body should be

relaxed, and no muscles allowed to exhaust themselves in useless grimaces simply because one is writing. I visited a school recently during the writing lesson, and nearly all the girls and boys were making the weirdest grimaces, with almost each movement of the pen.

I wonder if it is possible to estimate the nervous energy lost in this way. Nothing but differentiated muscle control will cure this lamentable waste of energy. This is seen also in the day laborer of low intelligence with a vocabulary of a few hundred words, who can hardly move each of his fingers without moving others, or all of them; who cannot move his brows or corrugate his forehead at will, whose inflection is very monotonous. All this illustrates a condition of arrest, or atrophy of this finer accessory system of muscles, and psychology teaches us, that if there is an arrest of these fine muscular activities, there is also an arrest of brain center activities.

To learn to conserve our energies! To

learn to revere the amazing stupendous force which has carried us from a cell in the ooze, to thinking manhood and womanhood! Body and mind and soul all evenly ignited by the fire of a reverent spiritual control!

SIMPLE EXERCISES FOR THE
HOME, OFFICE OR
SCHOOLROOM

CHAPTER VII

Simple Exercises for the Home, Office or Schoolroom

Let us take the schoolroom first, for while all reform should begin in the home, we find that most of it is left for the schoolroom. Let us suppose the teacher has a class of fifty pupils. She should never have more than ten in a class. If the aisles of the schoolroom are at least two feet wide, (which they should be) the pupils should stand in the aisles in rows, for the daily exercise.

Open the windows so as to be sure of fresh air. The first order should be "Rise, stand in perfect poise" (allow no shuffling of the feet nor sunken chests), and look to the poise of the head. Many children, owing to slight spinal deviation, carry their heads either to one side or the other. This must be corrected in the schoolroom, and not left

to the once a week or twice a week visit to the gymnasium; in fact, most of the gymnasiums pay no attention to this very grave defect.

When the correct position is insisted upon, all of the parts of the body at once fall into place. The second command should be to "sway from the ankle joints, forward and backward."

Third command. "Lips closed, inhale through nostrils, inhale as you sway forward, exhale as you sway backward."

Fourth command. "Raise the hands directly over the head, and as high as possible, palms of the hands facing to the front, and the elbows close to the side of the head. In this position sway toward the right, inhaling, bend back, and to the left, exhaling, and finish exercise by bringing the hands up over the head to the starting position."

In this position the pupil is ready for the following:

Fifth command. "Without bending the elbows, bring the hands downward, in front

towards the feet, as far as can be comfortably done, generally at first about as low as the knee, taking care to keep the knees themselves absolutely straight, if possible bowed even back, then return the hands high over the head." Each exercise should be repeated about six times. After a week, or at most two, the hands are gradually brought lower down, until they reach the floor, and until the entire palm can touch the floor. This exercise will remove all tendency towards holding the knees slightly bent, and so causing that weak, shaky and sprung look about the knees, so common among school children, to give way to a correct and graceful position.

Sixth command. Is one of the "sitting up" exercises, used daily at West Point, and should be taught daily in our public schools. "Stand in perfect poise, with the body absolutely vertical, raise the hands above the head, elbows straight, till the thumbs touch, then never bending body or knees a hair's breadth, and keeping the elbows unbent,

bring the hands slowly down, not in front this time, but at the sides just above the knees, the little finger and the inner edge of the hand alone touching the leg, and the palms facing straight in front." Now notice how difficult it is to warp the shoulders forward, even an inch. The chest is out, the head and neck are erect, the shoulders are held low, the back vertical and hollowed in a little, and the knees straight. "Carry the hands slowly back through the same lines, till again high over the head. Then bring them down to the sides again." Nine of these movements should be taken three times a day the first week, and as many as will not fatigue unduly afterward.

These exercises should be carried out in the schoolroom at four different periods during the day. I find that five minutes for each physical period relieves the unconscious tensions, keeps the joints supple, tends to give a graceful carriage to the body, and stimulates the brain centers by relieving the congestion due to unhealthy mental

strain. It is a fact that while specific exercises have been given to develop all the muscles, yet you will find many pupils who still carry themselves awkwardly, even in a slouchy and slovenly manner; the last mentioned exercise is directly intended to obviate this. It is one of the best exercises not only to give strength, but a fine, erect carriage, as the whole frame is so held that every vital organ has free scope and playroom, and their healthier and more vigorous action is directly encouraged.

Seventh command. "Perfect standing position, neck and head erect with the heels together and the toes turned slightly outward. Raise the heels slowly off the floor, the soles and toes remaining firm on the floor, sustaining the entire weight. When the heels are as high as possible, hold them there a moment, then lower again, till the whole foot is on the floor, then rise as before, and so repeat a few times daily." This exercise will soon express its benefits in the size, shape and strength of the feet

and calves, and especially so in the grace and springiness of the step itself.

Eighth command. "Correct standing position with the arms akimbo, and the feet as before; now bend the knees so as to stoop six or eight inches, then rise to the perpendicular, stoop again, and continue this six times, the feet never leaving the floor." This straightens the knees, while the front of the thighs gets the heaviest part of the work, though the leg below the knee is doing a good share, and yet the feet have not left their particular position on the floor. Then the pupil should stand with the right foot advanced above twelve or fifteen inches, suddenly rising on the toes, give a slight spring, and throw the left foot to the front, and do this at least seven times a day, during the first week, and increase as the muscles become strengthened.

This is a specific exercise for strengthening the thighs. Correct standing position with the knees together, do not raise the heels at all, but stoop down slowly as low as possible,

bending the knees greatly, the back, however, being held straight all the while. There is no better exercise for quickly giving size and strength to the thighs, yet scarcely any muscles in the whole body are more needed or used for ordinary walking.

Ninth command. Includes an exercise which calls into use the muscles across the abdomen, stimulating the stomach and other vital organs directly in their functions. "Correct standing position, raise the foot in front as high as the left knee, keeping the right knee unbent, hold the right foot ten seconds, then drop it again, repeat fully seven times, do the same thing with the left foot." In a way we may reverse this movement by thrusting out the right and left foot, high behind, and so continue giving each foot its equal work to do. The under thigh, hip and loin, are now in action, and being symmetrically developed, the pupil will find how much easier it is to run, than it used to be, and also that it has become more natural to stand erect.

Tenth command. "Correct standing position, knees firm, extend the arms out at the sides, at arm's length, close each hand firmly, and while inhaling deeply, make large circles at the sides of the body."

Eleventh command. "Clasp the hands together over the head, now turn them over until the palms are upward or turned towards the ceiling, and straighten the elbows until the hands are as high over the head as you can reach, and run quickly around the room, in this position." In this exercise it will be found that no apparatus whatever is necessary to get quite a large amount of exercise for the shoulders. In this exercise there is a fine stretching apart of the ribs, an opening up of the chest, the drawing in of the stomach and abdomen will be found to correct incipient chest weakness, half breathing, and any tendency towards indigestion.

Twelfth command. Have the class form around the sides of the room, standing three feet apart, and about two feet from the wall. "Place the hands against the wall,

just at a level with and opposite to the shoulders. Now keeping the heels all the time on the floor and the neck back against the collar, let the body settle gradually forward until the chest touches the wall, keeping the elbows pretty near to the sides, the knees never bending a particle, and the face held up, the eyes looking at the ceiling directly overhead, now push slowly off from the wall, until the elbows are again straight and the body back at vertical." Repeat this and continue nine times for each half of the day.

For expanding and deepening the chest, helping to poise the head and neck so that they will remain exactly where they belong in an erect position, and for giving the main part of the upper back arm a difficult bit of work to do, this will be a splendid exercise. Any flat or hollow-chested person will improve from the very first, if he persists in this exercise until the chest is properly developed. It also develops the back of the arms and spinal column.

These splendid exercises call for no apparatus, nothing save a floor to stand on and a wall to push against, and this is all that I have found necessary to develop half-built bodies into symmetrically developed, well-poised, perfect bodies. They constitute a variety of exercises, not only safe and simple, but inexpensive, which can be readily adopted in any school. If they are followed up faithfully, they cannot fail to bring a decided and most welcome improvement in the shape and capacity of nearly all of the muscles, while they give an erect and healthy carriage, and would send the children back to their studies much fresher and brighter for the temporary mental rest.

In addition to these exercises, the teachers must insist upon the value of an erect position in school hours, whether the pupil be standing or sitting, and we should soon notice the splendid improvement in making the crooked girls and boys straight, and so lessening their chance of going through life, either with delicate throats, or weak lungs,

but one more important thing is taking long, slow, deep breaths in through the nose. There should be, of course, broad, comfortable school chairs, and the pupils should be taught never to sit on half of the seat, or on the edge of it, but far back and on the whole of it, and never allow the pupils to cross their legs, because it is one of the most serious causes of curvature of the spine.

The teacher can work marked and permanent physical benefit to every pupil under her charge, by daily and steadily following up most or any of the above exercises. These exercises strengthen the postures, whether sitting or standing. When a teacher insists on having her children erect for several hours out of the twenty-four, and makes plain to each one by example in the perfect poise of her own body, the value of being straight and the self-respect it tends directly to encourage, there need be no fear that the pupils will grow crooked again.

It is strange that it is in the school, because of that instrument of torture, the

school seat and desk, that the grave danger of warping, twisting and crooking is done, and hence in the schoolroom of all places, must this serious damage be undone. Such school exercises with outdoor life, combine to tone us up, to invigorate our bodies, and keep off either mental or physical exhaustion and disease. It ought to produce health, symmetry, a good carriage, buoyant spirits, and a splendid share of nerve and agility.

The teachers of this country, it may be said, hold and mould the future in their hands. If they rightly understood their work, if they could but realize how easy it is, with a little judicious daily work to prevent or remove incipient deformity, to strengthen the weak, to form in the pupils the habit of sitting and standing erect, to add to the general strength, to freshen the minds, and to do good in various other ways.

We should not then see, as we often do now, large classes of pupils, stiffened by long years of hard overwork of some muscles, with others dormant and undeveloped.

It is during the important years of the elementary school life, that the lives of the school children can be shaped, not morally or mentally only, but physically as well. For moulding the body is as important, as moulding the mind. We find little bones that stick out when they have no business to, spines will curve and stay curved permanently, dorsal curvature, lateral curvature, double curvature and so on. How little is done in this particular to remedy this growing evil. The one shoulder a little higher than the other, will not be half so hard to restore to place in childhood, as when stiffened in its position, by long years of bad habits, which never should have been allowed a day. If the chest is weak and flat, or pigeon-breasted, now is the time to remove the defect.

Build the body in childhood, train the chest and shoulders to their proper place, teach the children to sit and stand, and walk erect, develop the back with full and shapely muscles, get the feet used to the work of

supporting the body properly, and the same boy or girl who would have grown up half built, ungraceful, ill at ease and far from strong, will now ripen into a manly, vigorous, well knit man or woman of sound mind and body, familiar with the possibilities of that body, with what is the right use and what the abuse of it, and knowing well how to keep it in that condition, which shall enable him or her to accomplish their life work in the full use of their powers.

For hundreds of years the mental training of our youth has been a matter of careful thought and study, and no effort is spared to obtain the best advantages of all the teaching of the past. The brains of the children have been kept under continual pressure, and yet that which would have helped them most at every step of their progress, and which would have fitted them to stand with ease, what now in a few years so often breaks them down, has been totally ignored, in other words we have built the top and neglected the foundation.

Another serious defect in the gymnasium work in the schools, is that too little regard is had for the vast differences in individuals, most of whom need much personal prescription. It is said that when the famous Hemingway Gymnasium was completed at Harvard in 1879, there was serious criticism to the effect that "unless this gymnasium had more intelligent management, than its predecessor had had, or that many of the gymnasiums of the land had, it might just as well have been a highly polished stationary engine without steam." This criticism will still apply to many of the gymnasiums of 1912.

It is in specific attention to the defects of the spines of the children that gymnasium methods are sadly lacking, in which apparatus may be distinctly injurious, in which the "muscular dosage" must be carefully measured lest the fatigue poisons develop which invariably result from a monotonous series of movements of a single group of muscles, especially if such movements are

carried out in a cramped, rigid and unnatural position.

A simple yet remarkable cure of that grave and widespread disease, curvature of the spine, has been discovered some few years ago by Professor Klapp of the University of Bonn, in Germany. The cure consists in making the children crawl on all fours like animals. The Professor was led to its discovery, by his observation of puppies. He found that, however badly twisted their spines might be at birth, they were always straightened out after they had crawled about the ground for a few weeks. From prolonged observation, he decided that the straightening of the puppies' spines was due to the crawling method of locomotion, and that on the other hand, curvature of the spine in children was either caused or intensified by the upright position. He concluded, therefore, that the proper way to cure the disease in children was to make them crawl about the floor like puppies. He put this plan into execution and quickly

succeeded in curing over one hundred children.

I have used this method since the announcement of the discovery to find that they not only do exactly what this noted surgeon predicted, but that the children enjoy the crawling exercises exceedingly. There are two principal classes of exercises, those in which the pupils move about and those in which they remain stationary in one spot. In the first class of exercises, the pupils start by resting on both knees and both hands, keep the arms straight and head slightly lifted backward, then they move forward on hands and knees, the hands being slightly turned outward. They put forward the right hand and the left leg, the left hand and the right leg. The body must follow these movements freely, and the spine will be exercised in a manner tending to cure its deformity.

The exercises in stationary position: The pupil supports himself on his knees, and places the hands near them, then he bends

the arms twenty times without moving the hands. In the next exercise each arm is bent separately ten times. After this the pupil bends the body backward till his arms are raised straight above his head, and then brings them back again to the original position at the knees.

Curvature of the spine is a disease that afflicts an enormous number of the children and grown people. It shows itself in misplaced shoulders and hips, hunch backs and other deformities. It causes injury to heart and lungs and other internal organs, and often leads to early death. The common method of treatment involves the use of steel braces, and other expensive apparatus, and of constant expert supervision by doctors and trained nurses. This treatment is not only inefficient but on account of trouble and expense, is beyond the reach of the poorer classes, who usually neglect a case of curvature of the spine in their children, unless it is exceedingly severe. But the crawling method of treatment requires

neither expense, nor expert supervision. It is very easily carried out under the direction of a trained nurse. Spinal curvature is principally due to the upright position of human beings, the head and the greater part of the body rests upon the spinal column, and bends it out of shape if it has any weakness. In the case of four-footed animals this weight does not rest on the spinal column, and in addition the very position on all fours will tend to cure any deformity that exists.

While the crawling treatment is in progress, it is desirable to remove any other causes which give rise to the disease, such as bad position at the school desk, bending back on account of short sight, etc. We can understand the value of the four-footed position in straightening the spine, when we study the movements of a dog. When the animal is in motion, the feet on one side are brought close together, and those on the opposite side are stretched far apart, the swifter the movement the more extreme are

the bringing together and the separation of the feet. By these movements the spine is first vigorously curved on one side, and then on the other. These movements render the spine straight, strong and supple, and correct any congenital deformity. In superintending the crawling exercises of a child, see that they sway well away from the convexity of the curvature. Teach the child to move his back freely from side to side, and not to keep it stiff, also moving the head from side to side helps the neck, and strengthens the back generally. A special exercise is designed to aid in strengthening the heart and lungs. The child stops still on his hands and knees and rotates his body from side to side. An exercise in which the pupil or patient copies the movement of a trotting animal is intended to strengthen the ribs and shoulders, especially when the disease is severe. Various exercises besides crawling are necessary to effect a cure. These are usually carried out in the quadrupedal position, or starting from that po-

sition. Taking the arms from the ground and bending up and down while still kneeling, is a very useful exercise. The exercises can be effective only if they are kept up for a great length of time, extending in some cases to a year or more, they then produce a permanent effect upon the body. They must never be performed until they exhaust the pupil, and resting in the proper position is of great benefit in correcting the deformity. Many precautions may be taken by parents to assist the cure of curvature or to prevent its development. Children should never be allowed to sit up at too early an age; the carrying of heavy books and school bags may lead to serious injury; a bad position in writing is the commonest cause of the disease; a child sitting at a desk too low acquires hunch back and lateral curvature of the spine. The desk should be capable of being regulated to fit the height of the writer. When a child is actually afflicted by curvature, he should not be allowed to write at a desk, the best position is in any

easy chair, such as a steamer chair in which the full length of the back can be rested and the feet taken off the ground.

Of the most vital importance is the question of nourishment. Children must be very well nourished, in order to benefit by the treatment; for curvature, they should have eleven or twelve hours' sleep every night, they should never be required to do the full regular number of hours' work at school. Rest and good nourishment will assist the natural tendency of nature to cure a diseased condition. In the early months of life, the child should be permitted to lie on his back and stomach, and never placed in an upright position. He should be encouraged to crawl freely, and not be allowed to stand or walk until he shows ample strength.

Young girls should not be permitted to wear corsets, as they aggravate curvature by adding to the weight placed upon the spine, and by hindering the tendency of nature to correct the disease.

SPECIAL EXERCISES FOR THE
VARIOUS MUSCLE
GROUPS

CHAPTER VIII

Special Exercises for the Various Muscle Groups

The following exercises are intended to strengthen any undeveloped part of the body:

TO DEVELOP THE LEG BELOW THE KNEE

The principal part of the leg below the knee is composed of muscles which raise the heel. Stand erect, with the head high, chest out, and shoulders down, keeping the knees well thrown back; have the feet about four inches apart with the toes turned outward. Now slowly raise the heels until they are high off the floor, and the entire weight rests on the soles and toes. Then drop slowly down. Repeat at least twenty-five times daily.

Another exercise for the same muscles is running on the toes, or rather the soles and

toes. Here the whole weight is held by and pushed from first the muscles of one calf, then of the other.

EXERCISE FOR THE SHIN MUSCLES

There is one other prominent muscle below the knee, that in front, running down along the outer side of the shin bone. Fast walking when one is unused to it, especially when the knees are held pretty straight, will work this muscle so vigorously as to make it sore, but a simple exercise for it is stooping down as low as possible, the feet being but a few inches apart, and the heels never being allowed to rise even a quarter of an inch off the floor. Lift the heels and this muscle is at once relieved; also walking on the heels with the toes drawn up high is simpler yet.

EXERCISES FOR THE FRONT OF THE THIGH

Stand erect with head and chest high, and the feet about six inches apart. Now bend the knees a little, say until the head has dropped vertically six inches. Then rise to

the perpendicular again. This movement is somewhat akin to that in dancing, the only difference is, that in dancing the weight is first on one foot, then on the other, while in the former, it is always on both feet. Again, instead of stooping for a few inches, only, start as before, with head and neck rigidly erect, and then stoop all the way down, and rise again. Continue this movement several times, as the strength increases, so should the number.

A more difficult one still, is holding one foot far out, either in front or back, and then stooping down wholly on the other foot. For perfecting the symmetry of the thigh, these exercises are unparalleled. Fast walking, jumping, long distance walking and running is excellent; running exercises, not flat-footed running, as the heel should never touch the ground.

The farmer and the laboring man, in all their heavier work of stooping over their tasks, such as lifting, shoveling, picking, digging and mowing, use the thighs much;

but keep them so long fixed in one position, with little or no varying exercise to supple and limber them and the joints, that both gradually stiffen, and their instep soon begins to lack elasticity, and the muscles harden.

Cycling is a splendid exercise to give an all round muscular tone, but does not compare with wrestling. The majority of cyclists sit in such a way as to cramp their vital organs and so impede their work. One should sit with the head always exactly on top of the spine, not poked two or three inches forward. It is not necessary to sit up as straight as a stick, lean forward slightly from the hip joint, as you would if you were running. Keep your head up, chin in, chest up, back straight, and mouth shut. So long as a cyclist can breathe with his mouth shut, he will not strain his heart.

Increase your lung capacity by practicing deep breathing as follows: Hold your head up, shoulders back, chest out; inhale slowly through the nose while counting seven.

Hold until you have counted three. Exhale quickly. Repeat, while making longer counts.

Hopping on one foot is a quick way to develop the calf, also frequent stooping down as low as possible is a sure way to speedily enlarge and strengthen the thighs.

TO ENLARGE THE UNDER THIGH

The muscles of the under thigh are developed by pressing the sole of the foot hard on the ground, just as it leaves it, also walking uphill, also standing like the West Pointer, in his "setting up drill," and with knees unbent, trying to touch the floor with the hands. Another exercise is standing with the back to the wall, and placing the heel against the baseboard of the room, and pressing hard backwards many times. These all develop the hidden biceps, muscles of the legs; while running with the foot thrown high behind excels them all.

TO STRENGTHEN THE SIDES OF THE WAIST

The duty of the muscles at the sides of the waist, is to hold the body erect. Often an

awkward carriage of the body is due to the weakness of these muscles, allowing the body to sway from side to side. Practice daily, hopping straight ahead on one foot, then on the other; also walking a straight line. Wrestling also, whether Cornish or Graeco-Roman, tells directly on these muscles. Another exercise which will speedily develop them, is to stand erect; put one hand as high over your head as you can, put the other as low down at your side as you can. Now raise the low hand and lower the high one. You will feel like swaying your body to one side as you do this, and sway it all you can. This exercise is one of the well known "Liver Squeezers."

EXERCISES FOR THE ABDOMINAL MUSCLES

A person whose abdominal muscles are weak will usually have a feeble walk. A simple device for training these muscles, which will take the place of a rowing machine, can be prepared in a few minutes. An ordinary bit of strap screwed to the base-

board of one's room, so that each foot shall have a loop of it to go into, and then a stool or hassock some eight or ten inches high to sit on, will produce marked results in a short time. Lie flat on the back, taking first a deep full breath, draw the feet upward, keeping the knees unbent, until the legs are vertical. Lower them slowly till horizontal, then raise again and continue. Then keep the legs down, and first filling the chest, now draw the body up until you are sitting erect. Then drop slowly back, and repeat several times.

COUNTERWORK FOR THE ABDOMINAL MUSCLES

While the foregoing exercises strengthen the muscles, they tend to contract, rather than lengthen them, and for sedentary people, inclined to stoop a little forward some exercises are needed, which shall stretch these muscles and aid in restoring them to their natural strength.

Stand erect, now gradually draw the head

backward until as far past the vertical as possible, return slowly to erect position. In the simple exercise these muscles were stretched to a greater length than usual, and in those who accustom themselves to drawing far back in this way, like the contortionists of the circus, these muscles grow beautifully elastic, and moderate performance in this way tends to stretch and lengthen muscles which in the great majority of people, are somewhat cramped and shortened nearly every hour of the twenty-four by habitual standing, sitting or lying with back either flat or almost curved outward instead of slightly hollowed in, and with the consequent sinking of the chest, while the drawing of the head and shoulders back swiftly as in boxing to avoid a blow, can scarcely be equalled as an aid in this direction. In fact the chief cause of being in-erect, is holding the head forward.

TO ENLARGE AND STRENGTHEN THE LOINS

While we are upon the waist muscles, there is another set of muscles, which de-

mand attention, and if they are weak, no matter how strong one may be elsewhere, he is weak in a place, where he can ill afford to be, and that is in the loins, or the main muscles in the part of the back, running up and down at each side of the spine.

Strong loins are always desirable. He who has them and is called on in any sudden emergency to lift any heavy weight, as the prostrate form of one who has fallen in a swoon, for instance, is far less likely to work himself serious, if not permanent injury, than he who has them untrained and undeveloped.

DEVELOPMENT ABOVE THE WAIST

The connection between the arms and the muscles, both on the front and back of the chest, is so close that it is practically impossible to have arms thoroughly developed and not have all the trunk muscles above the waist equally so. Inhale deeply, throw the arms up over the head, and describe spirals and circles with each hand a few minutes daily.

FILLING OUT THE SHOULDERS AND UPPER BACK

Stand erect and in perfect poise, carry the arms backward and upward, keeping the arms straight at the elbows and parallel, hold them there a moment, inhale deeply, and make large outgoing circles with each arm.

EXERCISE FOR BICEPS

Place one hand in the other and bear down hard with the upper hand, holding the neck firmly back; lift away with the lower hand and when it reaches the shoulder, lower it slowly to the side, and then raise again, and so continue. Mounting a ladder or a rope, hand over hand, lifting any weight in front of you, whether a feather or a child, picking up articles from the floor, holding weights out in front of you or at your side at arm's length, pulling downward on a rope as in hauling up a sail; in short, anything which bends the elbows and draws the hand in toward the shoulder, develops the biceps muscle, and if these exercises are persisted

in, this muscle will ere long become strong and well shaped.

TO DEVELOP THE MUSCLES ON THE FRONT AND SIDE OF THE SHOULDER

Sit erect on a chair, relax the torso, now twist the trunk of the body from the hip joint, first to the right and then to the left side; concentrate on the shoulder muscles, and finish each movement by bringing each shoulder up as high as the ear.

EXERCISE FOR THE FOREARM

Most of the exercises for the biceps and shoulder have also called on the forearm. Anything which necessitates shutting the hand or keeping it partly, or wholly shut such as holding anything heavy in it, driving, chopping, hammering, fencing single stick, pulling one's self up with one hand or both, going up a rope or ladder hand over hand, batting, lacrosse, polo, carrying a weight in the hand, will develop the forearm.

EXERCISES FOR THE TRICEPS MUSCLES

The triceps muscles are the bulk of what remains of the upper arm, after leaving out the biceps and the inner side of the triceps. When well developed, this is one of the handsomest parts of the arm. No arm will look slim, which has this muscle fully developed. To develop these muscles, push with the hands against almost any heavy or solid thing. If these muscles are small and weak they can be strengthened by the following simple exercise:

Stand facing the wall, and about two feet from it. Now fall against it, next put your hands on it about three feet apart, and as high as your ears, let your body drop slowly in towards the wall till your chest nearly touches it, your face being held up and back. Then push back till your body is again erect, and continue the movement.

Again place the hands on the floor, hold the body out at full length and rigid, or as nearly so as you can, and push, raising the body till the elbows are straight. Now

bend the elbows and lower again, till the face nearly touches the floor, keeping the body all the time as stiff and straight as possible, and then rise on stiff elbows again, and so on.

Another fine exercise. Place two strong chairs, back to back, draw them about eighteen or twenty inches apart, and placing one hand on each, holding the arms straight, and head erect, lift the feet off the floor, then lower till the chin is level with the hands, or nearly so, and then rise till the arms are straight, and then dip again, and so on; the knees and feet, of course, never resting on anything. This is one of the best known exercises for bringing quick development and good strength to the triceps or back arm.

For improving the ordinary grip of the hand, simply taking a rubber ball in it, or a wad of any elastic material, and repeatedly squeezing it, will soon tell. Simpler yet, is it to just practice opening and shutting the hand firmly many times.

TO STRENGTHEN THE FRONT OF THE CHEST

Each exercise for the biceps, tells also on the pectoral muscles or those on the front of the upper part of the chest, for the two work so intimately together, that he who has a large biceps, is practically sure to have the adjoining pectoral correspondingly large. But there are other movements which tell on them besides biceps work. Whenever the hands push hard against anything, and so call the triceps muscles into action, these muscles at once combine with them. Never attempt the severe triceps work such as the dips, without thorough muscular development, preceding the effort, as the strain across these chest muscles is very great, for they are a very important factor in helping to hold up the weight of the whole body. It is sheer folly for any one to try so severe a thing as a dip, when his triceps and pectoral muscles have not been used to any such heavy work. Many a person who has rashly attempted this, has had to pay for it, with a pain for several days at the edge of

the pectoral, where it meets the breast bone.

If you observe a gymnast in exercising costume, you will notice that while these pectoral muscles are almost huge, his chest has the appearance of not having been enlarged accordingly. He looks as though the bare frame work, would present actually a small chest. Many gymnasts have this appearance, for they take so much severe muscular work, that it draws from their vitality, giving them a stale and exhausted look.

It is obvious then, that the getting up of a large chest, and of large muscles on the chest while often contemporary, and each aiding the other, are too frequently wholly different matters, and bodily education has no more important problem, than how to develop a strong flexible chest.

TO DEVELOP A STRONG FLEXIBLE CHEST

The arms and shoulders are the medium through which the chest receives almost all it's exercise, the next important step is deep

breathing. Anything which causes one to fill his lungs to their utmost capacity, and then hold them full as long as he can, tends directly to open his ribs apart; stretch the intercostal muscles, and so expand the chest. Many vigorous muscular exercises do this, when done correctly, for they cause the full breathing and at the same time directly aid in opening the ribs. Notice for instance he who "curls" a heavy dumb-bell but does it with his head and shoulders bent over, as many do, while giving his pectorals active work is actually tending to cramp his chest instead of expanding it, the very weight of the dumb-bell all pulling in the wrong direction.

Every teacher should see that the pupils have a perfect standing position before beginning the exercises. Holding the head and neck back of the vertical, say six inches, with the face pointing to the ceiling, and then making spirals or circles with the arms is fine for the upper chest, tending to raise the depressed collar bones and the whole

upper ribs, and to make a person hitherto flat chested, now shapely and full, while the benefit to lungs would be invaluable.

Light easy running is a great help in enlarging the lung room, so is plenty of sparring, so is the practice of drawing air slowly in at the nostrils until every air cell of the lungs is absolutely full and then expelling slowly.

Public speakers and singers know the value of this and kindred practices in bringing with increased diaphragmatic action, improved power and endurance of voice.

Again standing erect with heels together, toes well out and hands hanging at your sides, keeping elbows straight, slap the backs of your hands together as high over the head as you can; at the same time rise high on your toes and soles. Do this slowly several times a day. This is a great chest broadener and is also good for the calves of the legs. Again stand as before; but this time keep the arms parallel and raise them in front as high as you can, rising on the toes and soles

as before; this is a fine chest deepener while the preceding one is a broadener. Five minutes daily exercise of this broadening and five minutes daily of the deepening exercise for every child in every school in this country, and sitting always erect, would in one year do more to prevent consumption than almost anything else that could be done. It needs no apparatus and it costs nothing. Only be sure of one thing namely, breathe as slowly and deeply as you can all the time you are at this exercise and see that your room is flooded with fresh air, it is as fine an exercise for adults, as for children. Also running slowly, taking just as short steps as you can is a rare chest expander. You can do this right in your room, right on one spot in fact, which is called still running.

EXERCISES FOR DEVELOPING THE NECK

A slim neck is usually a sign of weakness. You often see men with a grand head connected with a feeble body by a weak unsat-

isfactory looking neck. Put such a neck under Webster's head and his working power would have been so cut down that after his earlier years it is doubtful if he would have ever been heard of, for a feeble body could not long stand the demands of such a head. A large head usually indicates a great amount of nervous energy and when accompanied by a large neck is a sign of physical strength. So the splendid neck of a Mirabeau, a Luther or a Bismarck means something after all.

A splendid exercise for developing the neck is to tip your head over backwards slowly, as far as you can and as often as you can each day. Draw your chin far in many times daily, also turn your face slowly, as far around as you can. Now do it the other way and many times every day. Every morning and night and if you awaken in the night lie on your back; rest on your head and heels and nothing else. This is called the "Wrestler's Bridge." For until you make both shoulders of a wrestler touch the

ground at once, you have not thrown him. A few minutes daily of these all round physical exercises will develop a fine symmetrical body at the end of four months.

POSTURE EXERCISES INCLUDING
SPECIFIC MOVEMENTS
FOR OBESITY

CHAPTER IX

Posture Exercises Including Specific Movements for Obesity

From time immemorial, the code of practice of oriental mystics who aspired to perfection has been constant physical training, month in and month out for years. The result claimed and certainly in many cases accorded by impartial judges, is strength of character, personal power, unshakability of soul. I enjoyed the privilege of being a pupil of one of these famous mystics a few years ago, and agree with many who acknowledge that the present system of rhythmical breathing, and specific posture work, are very beneficial.

In regard to the breathing exercises, too much cannot be said, although breathing is an involuntary automatic act, yet conscious breathing is of great assistance, in gaining mastery over the breathing apparatus, and

acquiring a flexible condition of the thorax. A condition that is fundamental to all artistic singing, and speaking, and only those who practice the deep conscious breathing can understand what I mean, when I speak of the awakening of the great emotional, and spiritual powers, which enfold in obedience to the law of concentration, upon the breathing apparatus.

**POSTURE ONE, FOR PLACING HANDS AND HEAD
ON FLOOR**

Stand in perfect balance, in a perfectly relaxed condition, sway forward and backward a few times, throw the arms up at full length, stretch as high as possible, then bending slowly from hip joint place hands on floor, stretch some more, and place head on floor.

**POSTURE TWO, SAME AS POSTURE ONE, BUT
WITH ARMS OUTSTRETCHED AND RAISED
FROM FLOOR**

This posture compels a sense of concen-

tration in the main joints of the body. The position need not be held over one half a minute.

POSTURE THREE, STANDING, RIGHT FOOT IN
FRONT OF LEFT. SINK SLOWLY TO
THE FLOOR

Stand in perfect poise, slowly relax the body from joint to joint, place right foot immediately in front of the left, sink slowly to the floor in this position, then rise slowly to standing position, and reverse exercise.

POSTURE FOUR

As the transitional movements cannot be given in an illustration, I can only give in the picture, the final position of each movement, but all of these are taken with music of decided rhythm, and the transitions are unfolded slowly, from joint to joint, thus compelling a sense of rhythm and concentration in persons, otherwise, seemingly incapable of concentration. They also bring fine results in persons of disordered mental-

ity. In posture four, we begin with the body in perfect poise, then slowly extend the right foot forward in a diagonal line, begin at this point to draw the foot in an outgoing circle to the right side, then draw right foot behind you and in this position, sink slowly to the floor. This will bring the right foot under you, and the left foot immediately in front of you, then slowly bend forward from the hip joint, and place head on floor, bringing the forehead, in touch with the floor, and left leg, then raise both hands up as high as possible, hold the position three minutes. This is difficult to do at first, but after some preliminary education, young and old enjoy these exercises as they lead to, and open up, the road to the finer and expressional movements of the aesthetic body work.

POSTURE FIVE, BOTH FEET TOUCHING OVER THE HEAD

Lie flat on the back in a perfectly relaxed position, inhale deeply a few times, then

raise both feet, throw them up over the head, and touch the floor. This is a fine exercise to restore disordered circulation, and also for the spine; hold position a brief moment, then take posture six.

POSTURE SIX, RIGHT FOOT IN THE AIR

Repeat same position, then slowly raise the right foot in air, according to line in the illustration, slowly place back on the floor, and raise the left foot up. Try to have the foot come in a line over the forehead, beyond it if possible, in order to compel the sense of balance.

POSTURE SEVEN, BOTH FEET IN THE AIR

This position is extremely difficult for any beginner, and should not be tried, by persons whose muscles have not been trained, it increases neuro-muscular control, and compels the feeling of certainty of balance.

POSTURE EIGHT

Take correct standing position, then cross right foot over left, sink slowly to the floor

as in first position, then bring right foot up to the left ear. Take correct position then cross left foot over the right, sink slowly to the floor, then bring left foot to the right ear.

POSTURE NINE

Repeat posture eight, and while in sitting position, bring right toe to left ear, and left toe to right ear, hold position one minute.

POSTURE TEN

Repeat sitting position as in posture nine, drop feet from ears, place both hands on the floor, by pressure of the hands against the floor, raise the body, slip the hands firmly under the body for balance, then walk a few steps on the hands. This is extremely difficult, and can only be done after great practice.

POSTURE ELEVEN

Take balancing position as defined in previous chapter, for the right diagonal balance, then extend right foot in a diagonal

line from the body, raise the right arm on a line with the shoulder, then standing in balance, raise the left foot on a line with the waist. Now clasp left foot with the left hand and place on the back of the head. This gives an added sense of balance, and is an excellent one for creating mobility of movement and suppleness of joints.

POSTURE TWELVE, MAKE TRIANGLE OF FEET

Lie flat on your back, slowly raise the trunk from the floor to a sitting position, then bring the feet in the position of a triangle, slowly drop forward, place head in space of triangle.

POSTURE THIRTEEN

Sitting with the feet crossed, Oriental fashion, let head drop in a diagonal line over right knee, and touch floor with forehead, then bring head in a diagonal line over left knee, and touch floor with forehead.

POSTURE FOURTEEN

Sit on floor, feet outstretched before you,

do not allow any space between the under part of knees and floor, then slowly bend forward, and touch forehead to each knee.

POSTURE FIFTEEN

Take position on floor for postures eight and nine, and try to join your hands, on the usually unapproachable upper part of your back.

POSTURE SIXTEEN

Take position for postures eight and nine, and try to bring the toe of your right foot to your left ear without bending the knee.

POSTURE SEVENTEEN

Sitting on the floor, feet outstretched, reach and grasp right foot with right hand, and left foot with left hand, then push out alternately, first right foot, then with left foot, inhaling deeply as you thrust the foot out, exhaling as you bring the foot back. This is one of the best exercises, for the muscles of the entire body, as it awakens and stimulates the muscles of neck, shoulders, trunk, arms, thighs, and legs.

POSTURE EIGHTEEN

This is the twist balance illustrated in figure eighteen. This is one of the most important exercises for increasing the neuro-muscular control.

POSTURE NINETEEN

Take wide base position, then several deep inhalations, sway slowly from side to side, finish exercise as given in illustration.

POSTURE TWENTY

Before taking position in the illustration, stand in perfect poise, place left index finger on left nostril, inhale slowly through right nostril, hold while you count seven; then place index finger of right hand on right nostril, slowly exhale through left nostril, and finish exercise with upward stretching of arms in spiral movements.

POSTURE TWENTY-ONE

Take position in illustration, then slowly bend from hip joint, and place forehead on right knee. Reverse.

POSTURE TWENTY-TWO

Take a relaxed standing position, inhale deeply, exhale slowly, then slowly drop head and torso backward, bending from hip joint, and take position in the illustration.

POSTURE TWENTY-THREE

Posture twenty-three is a continuation of the movements in posture twenty-two, until the body is in the position illustrated.

POSTURE TWENTY-FOUR

This exercise is one of the best in the series given for compelling a sense balance; the trunk of the body is turned quickly toward the side of the outstretched leg, then the pupil immediately assumes position as in posture twenty-two. Always reverse movements.

POSTURE TWENTY-FIVE

Take correct standing position, slowly relax the body, draw left foot behind right, and sink to the floor, taking position in illustration.

POSTURE TWENTY-SIX

Reverse movement, taking position in illustration.

POSTURE TWENTY-SEVEN

Take standing position with arms outstretched, move left foot forward in a diagonal line from the body, bend left knee, then slowly bend trunk of the body toward left knee, drop head to the floor inside left foot and take position in illustration. Reverse position.

POSTURE TWENTY-EIGHT

In this movement, the head is a little beyond foot, with outstretched leg touching floor.

POSTURE TWENTY-NINE

In this exercise, the body should be held in perfect balance, with hands clasped high over the back as in illustration. Reverse position.

These posture movements create a feeling of relaxation, harmony, pliancy, and above all compel concentration, through the sense

of balance, all of which things are extremely restful. Any of them can be practiced anywhere, and at any hour of the day or evening without attracting notice.

They teach how to sit down gracefully without any awkward or unnecessary movements, how to get up in the same way, how to stand so as to be at rest, and above all, they teach how to breathe so as to keep the circulation in good order.

Repose of movement means grace, rest and health, and in these strenuous days we all need as much help as we can obtain in order to reach these things.

Spontaneous attention and concentration is conditioned by spontaneous muscle tension which is a function of growth and development. Scarcely a pupil has ever been allowed to enter my dramatic art department, who has not been trained in this entire range of physical work. The only ones excepted were those who were the victims of some congenital defect. The aim of this work has been to do everything physically

possible for the human body as a mechanism. No engineer would treat his engine for a day, as we treat our bodies, year in and year out. Many positions and attitudes are assumed, for thoroughly accelerating and eliminating waste products from the system. We rarely stop to think of the deadly increase of the number of degenerative diseases of our time, due to the inactivity of the eliminating processes of the body, such as the lungs, kidney, liver, skin and so forth, that have been clogged for years, before the fatal breakdown came, when a few minutes, say half an hour daily, would suffice to give us as pure, sweet, and healthy a body as a baby.

In one of the large Eastern cities lived a young Harvard man, a noted jurist, six feet tall, of superb physique, who weighed one hundred and eighty pounds. A fine, strong man, of good habits, who looked as if he would outlive Bismarck or Gladstone. This young man (one should be very young at fifty) broke down and died in his forty-

seventh year. For a year previous to his death he looked anæmic. His death was due to cancer of the liver, and yet it is a fact, well known to physicians and specialists, that muscular exercises which furnish active nutrition to the muscles, is unfavorable to the deposition of morbid matter.

Many eminent thinkers have noticed that physical exercise is favorable to brain work. Herbert Spencer, for instance, tells of the intellectual stimulus he got from physical exercise, although insomnia and defective vision were evils from which he suffered. His nervous trouble had been ascribed to that cause. Instead of consulting an oculist, he persuaded himself that his trouble was due to his cerebral circulation. He resorted to various devices for self cure. He cultivated all indoor and outdoor games as safety valves. While composing the earlier parts of his First Principles, he would first row in a boat for a quarter of an hour, to make the blood flow freely through the brain and then would dictate for hours. It is



POSTURE 1

Photo by Matzen



POSTURE 5

Photo by Matzene



POSTURE 6

Photo by Matzen





POSTURE 14

Photo by Matzen



POSTURE 14

Photo by Matzen



POSTURE 18

Photo by Matzen



POSTURE 19

Photo by Matzene



POSTURE 20

Photo by Matzen



POSTURE 21

Photo by Matzen



POSTURE 22

Photo by Matzen



POSTURE 23

Photo by Matzene



POSTURE 24

Photo by Matzene



POSTURE 25

Photo by Matzen



POSTURE 26

Photo by Matzen



POSTURE 27

Photo by Matzen



POSTURE 28

Photo by Matzen



POSTURE 29

Photo by Matzene

note-worthy that his confidence in the power of good circulation, to stimulate thought, is justified in one of his most abstruse efforts "Transfigured Realism," which was dictated in the intervals, of a game of racquets.

In studying the biographies of the famous men and women, who have lived to great age, it is remarkable how often we read of the emphasis many of them placed upon some particular phase of physical exercise, and indeed it would seem, that the capacity for splendid muscular development is retained until long after youth. I do not hesitate to say, that with the right kind of exercise it may continue until extreme age arrests all development.

Kant, the great metaphysician, applied his utmost intelligence, to the task of making his body the obedient instrument of his mind, maintaining that one should know how to adapt himself to his body. Kant tried to do away with the disadvantages of his small and badly formed body. "On

account of my flat and narrow chest" he wrote a friend, "which affords but little room for the movement of the heart and lungs, I have a natural predisposition to hypochondria, which in earlier years bordered on weariness of life. While I felt oppressed in my chest, my head was clear. The oppression in my chest remains, for its cause lies in the structure of my body, but I have become master of its influence on my thoughts."

Many noted writers seem to agree in believing, that the state of the body accounts for the emotional life, and decides whether a man becomes a hypochondriac or a mentally well balanced person. The essence of the optimistic philosophy of today may be summed up in that beautiful thought "Whatever is, is right." Darwin has said that no one could observe without a theory; 'tis a fine point in metaphysics, but if your experiences in life have converged into such a belief that you can accept Pope's theory, even then you cannot but wonder that the

phrase "Whatever is, is right" was penned by one so put upon by nature.

Pope was a deformed and helpless invalid, but his mind was brilliant, his energy inexhaustible, and his will strong. It may not be amiss to state another form of physical exercise, which provided a great brain stimulant to one of the most illustrious brains in history. I am not quite certain, that it would be a popular or desirable form of exercise. At school, Sir Isaac Newton, showed no great aptitude for study, and doubtless would have remained low in his classes, but for the fact that he was incited to get ahead of a boy who kicked him in the stomach, after this stimulating kick he worked industriously and became the first scholar of his class. We read in the life of Heine of the excruciating agony he suffered in his invalidism, and how it became prolonged into a twelve years' martyrdom during eight of which he lay with spinal paralysis, a prisoner to his bed; yet he worked industriously, and had an indestructible

joy in life. The question may arise in the minds of some, as a sort of plea for inactivity how these men, could have attained such marvelous brilliancy of mind, while the body was inactive, and I reply, these are cases of a higher development, in whom a finer heredity has worked out, and cast behind, the mere sense characteristics of dominating ancestors, and so biography teems with names who have won achievement in spite of bitterest obstacles. They turned suffering to a glorious account, and we learn from such victories, that we can gather from triumphs over the body a new consciousness of the divinity of the spirit.

Obesity is not a disease, but a symptom of a disease. In my illustrated lectures on the body, I never give the specific exercises for obesity, because I have found that many in the audience went home and tried them, which in some cases resulted unpleasantly. Two years ago I gave a lecture upon this subject before one of the Mothers' Clubs. A mother whose daughter of six-

teen weighed one hundred and eighty pounds, insisted upon her daughter going through some of the exercises, which I had illustrated. The young girl might have been permanently injured, as her muscles had not been trained up to the point of endurance, for such exercises. In prescribing exercises for my pupils, I always take into account their previous muscular education, and general physical condition, and "Muscular Dosage" is one of the most vital problems in physical education.

Teachers of physical education, should have the trained eye to detect any defect of the spine, any physical idiosyncrasy of movement, because that is usually due to weakness of certain muscles; the trained ear to detect any weakness of the heart; the trained hands to detect any defect of spine, not apparent to the eye. Treatment of the obese should always deal with causes, and not effects. The truth of the matter is, that dieting alone, combats effects and not causes, so that as soon as the treatment

ceases, the fat returns as rapidly as possible. We must know the cause in each case, and the radical key to the cure, will lie in treating the cause, instead of the effect. Surgeons have observed how profoundly the effects of wounds depend upon what is called the morale of the individual, and it depends largely upon this very morale of the individual also, as to how quickly, the fat will vanish. I must say from a very wide range of experience, that it is not true that the fat people are very heavy eaters.

To be sure, very many of them are, while many owe their fat to sedentary lives, and overfeeding. There are large numbers of heavy eaters who do not grow fat. It is well known that many infectious diseases, such as typhoid, grippe, pneumonia, etc., may lead to morbid increase of flesh and obesity, and that this obesity is the result of internal auto-intoxication, which upsets the functions of assimilation and disassimilation, as regulated by the nervous system.

On the other hand, I find that many ex-

treme cases of obesity are due to nervous troubles. Fat people are generally neurasthenic, irritable, and very impatient. They eat rapidly, do not masticate their food, and that is one of the frequent causes of obesity. Therefore, treatment should always deal with the cause. It is always most illuminating to let the candidate for slimness talk with you in regard to the obesity, in that way you get a splendid idea of the morals of the individual, and as no persons are allowed to take these specific movements for obesity, until preliminary exercises are thoroughly understood, the first effort is to prevent the muscular atrophy, which always accompanies the infiltration of fat in the various muscles of the body. An inactive muscle usually becomes infiltrated with fat, this causes atrophy. In order to get at the seat of the trouble, there should be progressive physical training, for the ordinary exercises, usually prescribed, are valueless.

The exercises for obesity are a sort of scale, one note blending into the next, and

so leading up into a progressive muscular training of the body. The first are exercises for correct poise, and always deep breathing. This will make the fatty masses on the abdomen disappear, as well as that on the hips and neck, and make the skin firm, increase the organic combustion, eliminate autoin-toxication, and reestablish permanently, the symmetrical development of the muscular masses. Then we lead up to the difficult posture movements, and prescription movements, which correct all circulatory troubles increase the heart power, aid kidneys and liver, help digestive functions, and bring about a normal bodily condition.

The Hindoos are most particular about posture. So carefully have they studied the effect of positions of the body upon the muscles and nerves, and breathing, and so forth, that they are able to take a person who is depressed, and put him in such a position, that he cannot possibly feel depressed.

Quite apart from this, the right position

of the body, which is as a rule with chin in, chest forward, small of the back slightly hollowed, and feet balanced rather upon their balls, make an enormous difference to every function of the body. Then there is the regulation of the breathing. While you perform some movements, let us say of lateral extension of the arms, you should keep your breathing, as deep and full, and rhythmical as possible. To let your breathing be held, or become jerky, because you are doing a rather difficult movement, is to lose much of the value of that movement, but there is a third, still more important matter, in addition to the maintenance of the proper position of the body, and the keeping of the correct breathing; it is, the relaxing of the muscles. Scarcely any teachers of physical culture insist that their pupils shall learn, not to use the muscles, which they would gain nothing by using. In ordinary economy, it is of the very essence of the art, not to use the money which one would gain nothing by using.

I call my method the "Mentalization of the Body," as most fully expressing its purpose. If these exercises are strictly adhered to, a normal condition is absolutely assured in from three months to a year. One should not lose more than six to eight pounds per month, and as the average reduction desired is usually from thirty to seventy pounds, it is not difficult to calculate the duration of the cure. It is not wise to empty the tissues beneath the skin too rapidly, for the skin will then become flaccid. The exercises will produce a gradual loss. They are relatively easy and take but a small part of one's time or energy.

Most fat persons are muscularly weak, because they do not use their muscles, which have become atrophied, and at the same time, the neuro-muscular tonicity has been lessened on account of the condition of autointoxication. At the same time, the autointoxication must not be increased by the discharge of too much poison into the blood, by overexercise. Every day the

fat person should exercise for not more than fifteen minutes, then the length of time should be gradually increased to forty-five minutes. These exercises, at first, must be taken slowly, then regularly; the greatest improvement will be noticed at first in the heart action; it undergoes a change in size and structure, its muscular fibres become large, and the whole tissues become firmer and denser, it frees itself from the fat that oppresses it, and diminishes the elasticity of its fibres. For a vigorous heart drives the blood more energetically and makes it traverse the capillaries without difficulty.

While we are upon the subject of obesity, it is very necessary to speak of diet. Diet might almost be called an unexplored science. There is a deep practical implication in the following story. Kean the actor always suited his diet to his part. When he played the lover, he ate mutton, when he played the murderer, he ate beef, and very underdone pork for tyrants.

Science has revealed the fact that the

brain is the most sensitive of all the organs to the poison of imperfectly digested food. Scientific folk have shown that the quality not only of a nation's muscle, but of its mind, is dependent on what it eats, that a nation's food has a whole lot to do with the nation's civilization. We know all this so well that we never think anything about it. We know that a carefully studied, carefully prepared, balanced ration increases our mental and physical output, in just the proportion that it is carefully studied and prepared. We know that a puppy or a colt can be stunted by under, or poor feeding, or brought to fine size by proper feeding; we know by this analogy that poor food makes a poor man.

If we approach the food problem from the same basis, that we ought to approach any other vital problem of life, that is, from the scientific basis we will find it a life study.

To feed humanity properly demands a special knowledge of sciences of which chemistry and physiology are a mere part.

It is a well known fact, that the average wife is utterly void of special knowledge of food science. Perhaps this ignorance is not her fault, she may have been kept out of the kitchen as beneath her notice, as so many of our American girls are, and she of course expects to carry on her profession of human and home-making by intuition or the cook book. One thing she certainly has not, this average woman, and that is any special training, for the highest, loveliest, and the most sacred of the arts, Motherhood. She is the victim of the world old superstition that this wonderful knowledge comes instinctively to Mothers, as a sort of post-graduate divine anointment, whereas of course the pitiful truth is that no other responsibility in the world is so frequently, so tragically bungled.

The main reasons for obesity may be divided into two classes; the predisposing causes, and the exciting causes. Let us for a brief moment consider them in turn.

The first or predisposing cause of obesity

is undoubtedly hereditary. In a record of four hundred and fifty cases of corpulence, it was found that sixty per cent inherited the tendency from parents or grandparents. Also there are many interesting cases to show that obesity may skip a generation before manifesting itself. Still a study of the subject reveals the fact that heredity cannot be credited with more than about half the cases of obesity. Another factor is that of age. We take it for granted that the cases of obesity which are due to heredity can invariably be recognized as abnormal in early life, and then such measures adopted, and such precautions in diet and exercise observed, as to minimize the tendency.

In the non-heredity cases, the tendency to take on flesh is usually observed at or about middle life. Observation of a large number of cases would incline me to place the usual ages at from forty to fifty for men, and from thirty-five to fifty for women. In middle life the capacity and inclination for vigorous

muscular exercise are lessened, and the need for the ordinary intake of nourishment diminished. But as a rule, the habits of eating and drinking have by this time become thoroughly fixed, and the usual quantities of food and drink are consumed, so that this surplus is often stored in the system as fat, and so the tendency to obesity starts. This is clear from the following illustration. Suppose we fill a stove up with coal day after day, without removing the ashes and clinkers; we may put them down and stir them around in the stove, and go on having some sort of a fire for quite a while but eventually the stove becomes filled and it is impossible to get in any more coal, until it has been cleaned out. This is because the sides of the stove have no elasticity, but in the body when we do practically the same thing with food, instead of coal, we find that the skin is elastic, particularly around the chest, abdomen, hips, limbs and so forth. It can be stretched and puffed out to hold a whole lot of the fat, which corresponds

to the ashes and clinkers in the stove.

The answer to "Why do people get too fat?" may be briefly said in a few lines. A few do because they inherit the tendency. A few more because of age or occupation, or both, but most people do, because their daily diet is not in accordance with the actual requirement. The food eaten being either badly balanced, as to quality, or else excessive in quantity. The skin, as one of the great ventilators of the body, should at all times be kept perfectly clean. I believe that nutrition should be taken in moderation and at proper times. If the food is in excess, as it is very apt to be, the waste naturally accumulates in the stomach, the intestines, the liver, and the circulation, producing an injurious effect upon the whole system, but especially upon the mind through the action of the brain.

The strongest and most harmonious minds can become perverted and entirely changed, in their line of reasoning, by derangement of natural physical condition. Voltaire said

that the massacre of St. Bartholomew was due to the incapacity of the king to digest his food, but that massacre falls into insignificance when we think of the daily destruction of brain cells, as a result of bad cooking, wrong diet, and so forth. A study of the subject reveals the fact that heredity cannot be credited with more than about half the cases of obesity.

Of all the evils from which humanity suffers as old age creeps on, there is not one more common than excess of fat, or one that causes greater discomfort, and indirectly tends to shorten life. In man this is quite apparent between the ages of forty and fifty, in woman it is painfully apparent a few years earlier.

While obesity may not be a disease in itself, unless it attains enormous proportions, it often induces disease by preventing the victim from taking the necessary exercise that nature demands to stimulate the functions of the different organs that keep the body in proper health. After the age of

forty, particularly in women, excess of fat becomes almost the rule.

Among the chief determining causes of obesity the first is of course excess of food and too little work. Though some people curiously enough may be very fat and still have poor appetites, some seem to get fat eat what they will, while others remain thin and scrawny on the most luxurious diet. Drink also has its influence; fat people usually take a large quantity of liquid, and in some of its forms, such as sweet wines and malt liquors, it is very fattening.

Deficient muscular exercise by diminishing the amount of wear of tissue (oxidation of tissue) favors obesity, and since as a rule the stouter the person, the less capable he is of taking exercise, these two conditions react one upon the other to the advantage of fat production.

All states of the system that prevent the proper circulation of the blood, favor obesity by limiting its oxygen power by preventing its conversion into carbonic acid

and water and its elimination from the system, by the breath. In this way exercise, by rapidly circulating the blood through the lungs, gets rid of fat from the system. We must realize that accumulation of fat is a perversion of nutrition which, if once established, and with a strong hereditary predisposition, cannot be cured, it follows that we should endeavor to prevent as far as possible its increase by avoidance of these factors which, science tells us, are favorable to its development.

As a convincing illustration of the results to be obtained by diet and exercise the case of Luigi Carnaro—a Venetian gentleman of the 17th century, after a wild youth, which destroyed his health, restored himself after the age of forty to perfect health by a most rigid diet. He had each day a careful allowance of 12 ounces of food, bread, meat, and yolk of egg, and 14 ounces of light Italian wine. He wrote his book at eighty-three, and lived on his hermit fare until nearly a hundred years old, and enjoyed ex-

cellent health. His wife, who we may presume fared in the same manner, lived nearly as long.

Obesity creeps on so insidiously and slowly, and the individual becomes so entangled in its toils, that he or she finds, when it becomes necessary to grapple with it, the power to do so curtailed and the effort of taking the necessary steps so burdensome as to be practically impossible, or too painful to continue.

Indeed it is not necessary to burden one's self with rules in regard to obesity. When a person begins to take on flesh it is for one or two reasons, or for both reasons. Too much is taken into the body, or too little eliminated. The obvious thing, then, is to take in less and to stimulate the outgo, by eating and drinking what will cause more perspiration, also the thorough training of the Body, along the lines indicated in this book, especially the movements for Obesity and Balance.

Of course long walks in the open air are

always to be commended, for oxygen burns up fat as a furnace flame licks up coal. Walk a stated distance each day, be absolutely certain that you know how to walk before you begin your long walk; be sure to hold the body in perfect poise.

There are various systems of diet for the treatment of obesity. In some cases if the usual quantity of food is diminished, no special diet is necessary. But remember that an ounce or two of food each day, in excess of that which is needed, stored in the tissue in the form of fat, produce a dangerous increase in the weight of the body; in a year it would amount to many pounds. It is well to remember that too much food, and too little exercise, are the principal causes of obesity. Fat persons should eat less, drink less, sleep less, work harder, and they will soon weigh less.

Fatty degeneration of the heart is often caused by eating rich and starchy foods, by alcoholic drinks, and by neglect of moderate daily exercise, and the heart like the rest of

the system, grows weak and flabby for want of use. The best medical authorities tell us that heart disease would not claim so many victims, if it was kept strong by moderate exercise.

Violent exercises that strain the body, or of a kind that is short or jerky, will do more harm than good, affecting heart and lungs. Nervous persons should be made to take all their exercises slowly.

After one has acquired a fine poise and carriage of the body, one half an hour a day is sufficient exercise to keep one's self in a good physical condition. Exercise perseveringly with this system of muscle culture; hold yourself down to a nearly abstemious, yet reasonable diet; don't drink with your meals, and above all, keep the brain active with some particular line of study.

If Bismarck could take off seventy pounds after he was seventy years old, what is to hinder any one from doing the same thing after he is forty?

By following persistently the exercises

outlined in this chapter, we will soon be repaid by losing at least two pounds a week. These exercises will not subject the heart or lungs to any undue strain.

LONG LIFE AS A RESULT OF BRAIN WORK

CHAPTER X

Long Life as a Result of Brain Work

The scientific investigation of old age shows that senility is nearly always precocious, and that its disabilities and miseries are for the most part due to preventable causes.

The human body is composed of billions of cells. They are made from the liquids we drink, the air we breathe, and the food we take into our stomach. These materials are then converted by the wonderful processes of digestion and assimilation into cellular life. These cells come into being, live their brief lives and then die, and having become dead matter, they should be eliminated from the system. If not, they will clog up the arterial or piping system of the body. Under these conditions, the muscles and organs are not properly supplied with blood and material for repairs, and conse-

quently they will deteriorate and exhibit indications of what we know as age.

But if the arterial and venous system, with its vast network of capillaries, can be kept clear of such deposits, the walls would remain in the elastic condition characteristic of youth. The heart would pump the blood through those elastic arteries and capillaries without difficulty. The muscles and organs being properly nourished and supplied with materials for repairs, would retain their vigor, and the body present the appearance of youth, even at an advanced age.

The ashes of the cells cannot be eliminated from the system by any lymph, serum, elixir, or any medicinal preparation. The process of cleansing these arteries, whether the largest artery, or the most microscopic capillary, can only be effected through alternate contractions and relaxations of the muscles, that being Nature's method of cleansing the body of impurities. It cannot be accomplished by any other means.

Cease muscular activity and you com-

mence to die. Saturate the system with medicine, stuff yourself with so called health foods, diet rigidly, you will not succeed unless the dead, clogging matter, the true cause of old age, is eliminated.

The real secret of health, strength and elasticity of body and longevity is not only muscular activity, but brain activity. Age tends to cause the deposit of calcareous salts in all the tissues of the body. The arteries of old people are hard and deficient in elasticity, the fibrous tissues are indurated, the ligaments ossified.

Exercise of a limb preserves the mobility of its joints and opposes the tendency to calcareous formation, while if muscles and joints have been inactive, they become ankylosed, that is, the bones forming the joints become ossified together.

When a muscle is contracted, any wornout dead matter which may have deposited at that point is forced out into the glandular and venous system, whence it is carried off by the excretions of the body. When that

muscle is relaxed, the action of the heart forces a fresh supply of blood and tissue building material to that muscle, and with it that material power, the vital principle, hence growth.

Any muscle so exercised, that is, alternately contracted and relaxed, increases in size, strength and elasticity, and any adjacent gland or organ shares in the improvement. This law applies to all parts of the human body. If the entire muscular system is systematically cleared of dead cells and other clogging material, by this process a thorough rejuvenation results.

These alternate contractions and relaxations are really a kind of muscle pumping exercise. The heart undergoes a change in size and structure; its muscular fibres become larger and the whole tissue becomes firmer and denser. It frees itself from the fat which oppressed it and diminished the elasticity of its fibres, for a vigorous heart drives the blood more energetically, and makes it traverse the capillaries without

difficulty. The lungs, the air cells of which are brought more into play by a more active respiration, expand and push outwards in all directions; the osseous walls of their prison, the thorax, expands, the ribs are raised, and the chest assumes a very characteristic convex shape. It is easy to understand how respiration must be facilitated by this increase in the size of the thorax.

The exercises for muscular contraction and relaxation make degeneration of the fibrous tissues impossible. As long as a man keeps his muscles at work, he remains able to use his limbs, for the persistence of function preserves the integrity of the organ.

I believe that it is possible by adopting a daily regimen in line with modern scientific knowledge, to defer the approach of old age for many years. Normal bodily exercises are to be encouraged. On the contrary, if bodily activities are not pursued, there must inevitably follow much more rapid retrograde changes in all the tissues.

In respect to the diet, it is universally ad-

mitted that after middle life, the amount of food taken should be less than before that time, and the changes in diet should be rather to use less of the structure-forming material, though not always to exclude them. In short, the simple rule should be observed, of eating no more than perfectly normal appetite craves, and as little as possible of those things taken because they are agreeable.

As the period of old age is reached, by which is meant about seventy years, the regimen should be markedly simplified, and always taken with the greatest deliberation. A good general rule is, that the more nearly the diet is reduced to bread, milk and fruit, the longer will the person live and enjoy good health. The best drink is buttermilk which seems to have a salutary effect on the action of both the bowels and the kidneys. Overmuch yeast bread is objectionable, disturbing digestion and encouraging rigidities.

The care of the skin is of paramount im-

portance, and the first desideratum is to employ systematic and thorough rubbing and brushing of the surface from head to heel. The flesh brush or mitten, made of coarse toweling, used by the patient for half an hour at a time, night and morning, serves many admirable ends, and is better than too much bathing. The skin of old age tends to become harsh, rigid and dry, and after this treatment it is well to rub into the body a certain amount of some oil.

The most important specific recommendations, I wish to offer for the postponement of the degenerative effects of age, and for the recovery of so much of the normal vigor as is possible in each, have to do with the forms and qualities of the exercises.

As has been shown, the tendencies of the tissues in advancing age is toward a steady and irretrievable hardening or stiffening or loss of elasticity, due to normal or abnormal increase in the connective tissue. The effect of this loss of cellular activity is noticed first in the impairment of the special senses.

Much of the dimness of vision, loss of hearing, and general slowness of brain action, common to the aged, can be delayed almost indefinitely by the employment of regulated movements of the neck and upper truncal muscles. Most of the defects of premature old age are due to lack of correct diet, sufficient exercise, and an incorrect carriage of the body.

Maintain proper attitudes under all circumstances. If the neck bones are held vertically, the ribs well lifted, and a moderate degree of tension exerted upon the abdominal walls, the viscera will rest upon and within the confines of the pelvis, and this position should be learned and practiced. Nor is it at all difficult if the attention is directed that way and some familiarity acquired in maintaining the correct position. The body cannot be held in normal attitudes unless the skeletal muscles are in fairly good tone, but most of the effects can be secured by a skillful use of the breathing exercises.

In short, attention to proper attitudes,

involving economies in interorganic relationships, is the one fundamental factor in postponing senile changes, and the real defensive measure against old age is to aid oxidation of the tissues by all rational means including special movements and stimulation of the vasomotor mechanism of the great eliminating organs.

The next important factor is the Culture of the Mind.

The fact that mental activity is conducive to longevity, has been dwelt upon by several noted alienists. To keep the brain in fine condition, one should use it constantly to the safe limit of its capacity, just as constant use of the muscles and other tissues of the body is essential to physical well being.

In the English rural districts, probably one-third of the agricultural laborers who survive the age of thirty or thirty-five die of paresis. The utter stagnation of agricultural communities in England and in various other countries may account in some measure for the development of paresis in those

past middle life, and for insanity among women. It is fortunate that in American rural districts, at least, the deadly insanity to which many of the farmer folk in other generations have succumbed, seems now to have become obviated by the welcome establishment in every nook and corner of the land, of the library, ten cent magazine, the telephone, and the trolley car.

The brain needs blood to keep it in health, and thinking induces the free circulation of blood through the brain tissues. A normal brain should never be permitted to rest except during sleep. Everyone should have a subject for study, to which he should devote what would otherwise be his leisure, and this not in a casual and dilettante way, but earnestly and with much interest. Professional men and women should study music and art, and should cultivate other intellectual pursuits.

Gladstone pursued with tremendous success, three different lines of study.

Voltaire turned from literature to science,

saying that "we must give our souls all the forms of expression possible to them."

Franklin wrote—"Eat and drink such an exact quantity as suits the constitution of the body, in reference to the service of the mind."

Bacon conceived his *Novum Organum* at fifteen, but it was not until the ripe age of fifty-nine, that he gave it to the printers.

Darwin wrote—"As soon as the stimulus of mental work stops, my whole strength gives away."

And so literature teems with sayings from the great minds of all ages, placing the emphasis on mental as well as physical activity.

Brain activity is characterized by a greater activity of nutritional exchange, and by a more abundant elimination of oxidation products. Therefore, I feel that brain activity is an absolute necessity for longevity. The mind need not reach its height of growth before seventy years of age, but it usually reaches it between twenty and forty.

Cultivate at least two lines of study, for

in one respect at least the man of intellectual capacity and pursuits is much better off than his brother who works with his hands. In the world of manual labor the pitiful dictum seems well established, that at forty the laborer is a "dead one." The intellectual man, however, despite the expression of a famous physician, maintains the vigor of his mind unabated, almost until he is ready to step into his grave; and if by this means he gains his livelihood, then need he not fear the lack of employment or emolument, even though his years be far advanced.

What we all need is to lay down for ourselves severe rules as to the distribution of time, social intercourse and so forth. Remember that a famous law book was written, because a Lord Chancellor chose not to be idle the fifteen minutes his wife made him wait each day for dinner. We need force of purpose and resolution. Many have not yet learned to will with that energy of fearlessness to which so many difficulties yield. Will is the basic principle of all

power. We know that exposure, exertion and conflict with difficulties do much to give tone to the body, and so they do to the mind.

Fight physical inertia with mental energy. In this way the superb science of Self Mastery grows until one attains a degree of command over mind and body which will make the pleadings of self-indulgence fall upon deaf ears.

Be careful not to overexercise, as it may cause a piling up of poisons which occur from a monotonous series of movements, involving only a single group of muscles, or a single limb, especially if these are carried out in a cramped and an unnatural position. Such movements, as the incessant use of the pen, of certain tools, etc., are far more fatiguing and injurious than generalized, symmetrical swaying movements of the whole body and limbs, and which involve the expenditure of from two to ten times as much actual strength. The reason is, that the former fatigues to the torture point one

small group of muscles, keeping all the rest of the body on a strain to hold this tiny group in the right attitude and position, while absolutely failing to give any opportunity for washing out the poisoned lymph from the muscles, or for its proper driving through the general circulation and lungs and liver.

When muscles are overworked, their action becomes tremulous, they waste their substances, become rheumatic and degenerate into untimely decay. The recent investigations in Berlin in studying the effects of exercise will be of invaluable service to the subject of Physical Education. Sport laboratories have been established and placed under the charge of municipal authorities, and everything that could throw light on the influence of sports and gymnastic exercises on the human organism, will be thoroughly investigated. One of the chief objects of the new laboratory will be the observation of all that affects school children in respect to food and physical exercise.

This, I feel, is a branch of municipal service most sorely needed.

Do not always be guided by your feelings in the matter of exercise, for when one does not feel inclined to exercise, is just the time he needs it most. Walking on the tiptoes, morning and night, while dressing and undressing, develops the legs tremendously, because of the unconscious swaying of the body, which it also causes; it aids in developing the elasticity of the body. Walking on the heels will develop the shin muscles.

Violent exercises, that strain the body, or of a kind like quick, short runs, will do more harm than good, affecting heart, lungs and groin. Excessive use of muscle weakens the brain. Excessive use of the brain (without physical exercise) weakens the mind. The organ most misused is the one through which death begins its work. Take great care that brains, lungs, skin, stomach, kidneys, bowels and muscles have only their own work to do.

It is hardly necessary to emphasize the

necessity for daily baths. Very cold baths shock the system and only react in those that are robust, hence should only be used in emergencies. For general use, the tepid bath is best.

Food is the fuel, and exercise or labor the blast that makes it burn. Exercise does for the body what intellectual training does for the mind, educates and strengthens it.

I think we all shall agree that the best of all blessings is health. Good health, and holiness are the same, for holiness really means "completeness." It is akin to the Saxon word "hāl." The soul needs a perfectly sound body, and while it is true that a great many of the best thoughts have been given to the world by those of feeble body; while it is true that invalids have often been geniuses, still today I feel that no one can be found to dispute the prime necessity of perfect health.

An ancient philosopher once said, the feat he performed of keeping his feeble body alive at eighty years of age was a greater

achievement than even to have written all his books, and there really is some truth in the old German proverb, "By the age of forty, one is a philosopher, an invalid, or a fool."

The fact that in the history of literature a few cases can be pointed out in which genius was lodged in a weak or diseased body is sometimes adduced in support of the false proposition that physical vigor is not necessary to professional men. Is it not somewhat paradoxical to hear such statements made by a University Professor at the recent International Eugenics Congress. He cited Kant, Spencer and Isaac Newton as examples of famous men who were born with infirm bodies, and were doomed to poor health, but as proving that this had no relation to their social efficiency or physical fitness. In direct refutation of this, let me quote Kant's own words as to how earnestly he tried to do away with the disadvantages of his small and badly formed body. "On account of my flat and narrow chest (he

wrote a friend), which affords but little room for the movement of my heart and lungs, I have a natural predisposition to hypochondria, which in earlier years bordered on weariness of life. The oppression in my chest remains, for its cause lies in the structure of my body, but I have become master of its influence on my thoughts."

A friend wrote of Kant:

"He applied his utmost intelligence to the task of making his body the obedient instrument of his mind, maintaining that one should know how to adapt himself to his body."

Pope was a deformed and helpless invalid, yet his mind was brilliant, his energy inexhaustible, because his will was strong.

Herbert Spencer also tells of the intellectual stimulus he got from physical exercise, and when his physician after treating him some time for insomnia, advised him to consult an oculist, Spencer persuaded himself that his trouble was due to his cerebral circulation, and he cultivated all indoor,

and outdoor games, as safety valves, etc.

The same writer does not believe in heredity. Let us read the words of St. Paul, Chapter No. 7, Verse No. 19, "For the good which I would, I do not, but the evil which I would not, that I do." Now if I do what I neither approve, nor wish to do, I am in no sense doing it, but the indwelling inherited tendency to deviation from the divine law is the accountable factor in my wrongdoing. Assuredly Paul of the Romans discerned, one might say almost foreknew, some of the great problems confronting the minds of modern psychologists today. He felt deeply the problem of the duplex personality, and questioned the doctrine, not of inherited propensity to sin, but of inherited responsibility for that sin. Although St. Paul implied in his use of the Greek word, an inherited tendency to sin, he nowhere intimated that sane adults, endowed with powers of examination and judgment, are not accountable for their sins.

St. Paul sought to show men that the

sins of the objective self are, at the instigation of impulses, committed in direct opposition to the holy instincts of the subjective self, the inward man; and thus was St. Paul the first to exhort human beings to put the subliminal self in control; the superior part of their nature, which delights in the law of God, above the carnal part, which serves the power of Sin. Such is the interpretation psychology would place upon the philosophy of St. Paul.

The longer one lives the more interesting and wonderful life becomes, or should become. Youth looks at life in the large, and takes it with easy and delightful rapture. It is only age that appreciates its infinite variety, that understands the significance of little things, that catches the clew to the "thread of all sustaining beauty" that runs through the apparently ugly. As romance is the realism of youth, so realism is the romance of age. Therefore, have I laid stress upon the necessity for exercise, even in advanced years, not that length of years

is the one significant fact of life, but that perfect health is essential so that we may be of service while we are here.

Browning expresses a glorious truth, when he puts into the mouth of Rabbi Ben Ezra, the saying:

“Grow old along with me
The best is yet to be.”

CONCLUSION

CHAPTER XI

Conclusion

Our generation has won for itself new tools, new laws and new liberties. Ours is called the scientific age, and it has taught us a new idolatry, the worship of the child. It has taught us that the bringing up of a single child demands the same individual attention as the production of a great work of art.

To those whose thoughts go beyond the mere surface of life, from its peaks to its chasms, the great demand is for the "Rights of the Child." No poet has yet risen to paint in soul-searing words the great black tragedy of childhood. However, the child is beginning to appear in literature as never before, and literature is always the unerring precursor of great movements.

The educative agencies must look to the care of the physical and emotional and

spiritual side, as well as to the intellectual side. A few of the great scientists are trying to do in the realm of human life what Burbank has done in the realm of plant life. According to Mr. Burbank, in order that children may grow up and realize, and fill out completely and beautifully the outlines of the life pattern capsule in each one of their young lives, it is necessary that the spiritual forces environing them must be recognized.

He said for a while he had worked with the idea that the natural forces were sufficient, but that in pursuance of his studies and experiments he had been led to see that in order to get the human results out of child life, that he was getting by guiding the natural forces in the plant life, the spiritual life in which every child lives, moves, and has its being must be considered and utilized.

A child is not simply an animal, capable of being fed and nourished by food which builds up the body, but it has a mind

which must be called forth by the truth to which it is related, and it has a soul which must also be put into harmony, for it great developmental possibilities.

As the human voice is the sounding board of the soul, I feel that the training of the voice in early childhood is of as vital importance as the training of the body. Just as the scientific training of the muscles is a true, cerebral stimulant, so also does the voice stimulate the brain cells into vigorous life. Nor do I mean the use of voice, as mere voice, for singing does not awaken great variety of mental action, but when the voice speaks in the registers, qualities, timbres, stresses, moods, and exquisite colors that are possible to this God-given faculty, the nervous tone and brain force and mental vigor are stimulated into life.

I do not agree fully with the great stress placed upon the sensory exercises in childhood, for we cannot but realize that the average capacity for sensitivity in the normal child is far in excess of the real demands

of life, and I question whether we should regard the sensory capacity as a conditioning factor in intelligence. We have only to read the prologue to Tennyson's "Princess," to fully comprehend how largely subjective and sensitively imaginative the mind of the child is, and that the "Higher processes" are the ever conditioning factors in a normal unfoldment.

In regarding the biography of one of the greatest geniuses of the nineteenth century, we learn that when he was a child of four, he put his arms about his mother's neck; his fingers coming in contact with the velvet gown threw him into spasms of tears. Was it this extreme sensitiveness that made of him a degenerate at thirty? We can readily see how limited is the world which the senses report to child or man, but how infinite the world which the "higher processes" awaken. I believe that children possess a wonderful inner structure of the spirit, which renders them so subjective, making of the first seven years of a child's

education the most important of his whole life. I believe that in the voice of the child we have found a pregnant quarry of psychological possibilities, open and ready to be worked. Burbank says: "Where one can produce one change for the betterment of a plant, one can produce a thousand changes for the betterment of a child. I have taken the common daisy and trained it and cultivated it by proper selection and environment, until it has been increased in size, beauty, and productiveness, at least four hundred fold. I have taken the little California poppy, and by selecting over and over again the qualities I wish to develop, have brought forward an orange poppy, a crimson poppy, a blue poppy. Is not the child as responsive?"

In the animal kingdom, and in the vegetable world, science points to its triumphs in controlling and improving upon Nature. Intelligent study and faithful experiment have produced not only bigger, better, and

more splendid specimens than Nature has been able to produce, but many new species of animals have been bred, which Nature, left to herself, never would have dreamed of.

The following story entitled, "How Burbank changed the Poppy Field from Yellow to Red," is interesting:

"One day, so runs the story, the Wizard stood looking at a bank of flowers, when the golden glory of the California poppies had turned the brown mass to a splendid color of gorgeous, imposing bloom. His quick eye caught sight of one poppy that bore a faint strain of red, a narrow pinkish line, drawn in a satin chalice of gold. This single poppy was jealously guarded. Next season its seeds were planted; from them came a brood of poppies, some as yellow as their forebears, some showing still greater hints of crimson. The yellow ones were destroyed, and the others retained, and the seeds again planted. An increasingly large number of reddish ones appeared the next generation. Day by day, through the years, as the poppies

opened to the sunlight, they were challenged with the utmost rigor, and none were allowed to live which persisted in wearing their yellow coat. At last after years had gone by, the test was brought to a successful issue, and in the season of 1904, a new floral wonder was produced—a brilliant crimson poppy, made from a yellow one, the other characteristics, length and shape of petal, size of flower, and all its parts left undisturbed."

We need in every city a Child Welfare bureau, for the protection of the health of children, doing as much for the son or the daughter of a woman, as the Agricultural Department now does for the son or daughter of a cow, a horse, or a pig, which shall conduct a vitally necessary educational campaign for all mothers; also a rigid medical examination of school children. It is a sad commentary upon twentieth century civilization, that out of the hundreds of millions lavished upon prisons, refuges, reformatories, asylums, and poorhouses, that

a much larger amount could not be had for education.

A lazy, blind government has given more attention to the study of the hog than to that of the mother or child. One of our senators, in a recent plea for a national health bureau, said: "So far as securing aid from the government is concerned, I would rather be a fat hog, suffering from cholera, than the mother of a large family, in the first stages of disease, for if the government was notified by the owner of the hog, it would hasten immediate aid in the form of bottled serum, while if the mother needed, and asked aid, she would receive none, for there is no Government Bureau to help her." Also it has seemed more important to some high government officials to agitate in favor of an increased birth rate, than to urge the protection of children already born. Has our government done anything so very great to modify or advance existing legislation concerning those already born? What has it done for the great problem of Child

Labor? And all this in the face of an enormous and admittedly greatly reducible infant mortality, and of the preventable enfeeblement of future generations, through proper legislation concerning marriage, and all this while the government was spending millions for the preservation of waterways and vast sums for preserving the giant trees of California, but practically no scientific steps to preserve the giant intellects of the American child.

Millions are spent upon improving the breed of domestic animals, studying insects and bugs. The government thinks it worth while to maintain a department to train farmers in the care of hogs, but does not consider the subject of training parents to properly care for their children, so that it would seem that the child, instead of being the first care of the government, was destined to be the last—a sort of afterthought.

The State of New York spends for the protection of game, fish and forest, about four times more than it does for the entire

State Health Department. Also an appalling expenditure for the care of its feeble-minded degenerate, criminals and insane. Does this not seem a spreading of the effect, instead of attacking the cause? It is not at all an exaggerated statement to say that these human misfits are produced by the primitive, educational methods which prevail in this country. Children in our large cities are required to attend school a certain number of days for a certain number of years, and to pursue certain studies, many of which in after years are of a very little help; then the children are turned out of school, only to become in an alarming number of cases, social derelicts, even criminals, as has been illustrated so tragically in New York and Chicago during the last few years.

We realize that the time is at hand when the educative agencies must undertake to wipe out this great evil, and to provide for the children of this country, especially the less fortunate children, something more vital than the old time inadequate stereo-

typed training. The recent investigations into infant mortality show us that about one-third of all our infant deaths resulted from "Congenital Debility" due principally to the ignorance or inability of the mothers, and not the poor mothers alone, to take proper care of themselves before their babies came. Education is all that is needed. The knowledge necessary to keep the majority of the three hundred thousand children alive, is yours almost for the asking.

A School for Mothers is no harder to establish than a kindergarten for children. New York has made itself a successful experiment station for the whole country. When a profounder culture will have given us deeper insight into these things, it will seem as natural for society to maintain its mothers as it is now natural for it to maintain its Army and Navy, the one a governmentally supported destructive body, to enter which requires the most rigid physical examination, the other a constructive power, full of illimitable possibilities, to which we look

for the building up of futurity, but to which great body, the government requires no entrance examination, and gives no support; yet the mothers perform the greatest, highest function when they educate the new generation. This is a force greater than armies and navies, a better source of wealth than any commercial or political triumphs. If this fails, the countries fail; the mothers of a nation are that nation's supreme asset.

In the education of children we must always lay especial emphasis on the physical side. One is overcome with deep regret in looking at a group of children at play, beautifully dressed, but with various signs of physical neglect. One feels that the mother had wasted time on their elaborate toilets, children with pitifully weak ankles and round shoulders, others bowlegged, knock-kneed, many with incipient spinal curvature, etc. Now what is the most valuable thing a child can possess, if it be not health, and why so little time and training given to their bodies, that are so painfully out of

adjustment, when precious bones and muscles are all going askew for the want of simple muscular training? Consider the awkward habit of toeing in, which so many young children have, and which if not corrected, when the limbs are plastic, will become a lifetime defect. There is a toein shoe, which orthopedic bootmakers supply, and which sometimes can be had at the large department stores. This is often effective, but the mother must admonish the child to turn the toes out, or tell him to walk with the heels closer together, which would likewise bring the feet in a more graceful position.

The splay foot habit is even more dangerous to health, for walking habitually with the feet in this position throws all the body out of plumb; the correct attitude for the feet in walking is an almost straight line, from toe to heel, with the toes turned out slightly. A shoe designed to correct or cure bowlegs in very young children is made to throw the weight of the body in

such a way as to counteract the tendency of the legs to curve outward.

Any sign of flat foot in a child should at once be treated with high boots, made in a manner to support the arch of the foot, as this defect spoils all the beauty of the foot and walk, and in extreme cases it is as bad as definite lameness. Flat foot means that the arch is breaking down, or has already reached that point, and aside from the ugly look the condition is extremely painful, and the strain tells on the health, and while the mechanical and orthopedic aids are necessary at times in acute cases, the primary cause is bad posture. Through specific exercises such conditions as weak ankles, concave chests, rickets, and other serious signs in little bodies can easily be cured.

The balancing exercises described in a previous chapter can be given to very young children, and in all cases will so thoroughly train the lower muscles of the body as to prevent any such imperfections. Physical education should begin, even be-

fore the baby is able to walk, by training the various muscles by resistant exercises before he assumes the difficult standing position, all tendency to curvature can be avoided. One can soon realize the faulty deficiency in the physical training of today, when according to the opinion of medical specialists, nearly every third girl has a crooked figure.

It is indisputable, that in spite of the growing popularity of the gymnasium, curvature of the spine is becoming more general, and the alarming increasing tendency to this particular deformity in growing girls must be given due attention in our public and private schools, colleges and universities, if we are to save the future race.

I am seriously opposed to gymnasium with apparatus for women. There is no value in apparatus. Can you imagine a spectacle more pathetic than a class of young boys and girls being obliged to go through a useless, often an injurious routine of exercises, with Indian clubs and dumb-

bells, their bodies badly poised, and also giving various indications of other physical weaknesses, such as splay feet, knock-knees, round shoulders, narrow chests, sunken loins, crooked ribs, short-winded, curved spine, weak back, bowlegs, etc., but all of them with a strained expression of eyes, following closely the movements of dumb-bells in the teacher's hands, whose body is very often badly poised; however, the teacher must not be blamed, she is just a product of an outworn method, just as the poor defenseless children are.

A beautiful body is every child's birth-right, and if there is a tendency to some weakness, or even to some congenital defects, unless it be of an acute kind, scientific body culture can develop a symmetrical body. In many cases, if the muscles for keeping the spine erect were properly developed in the schoolroom, curvature of the spine, due to muscular weakness, could be avoided.

Instead of this practical preventive work

being made compulsory at schools, girls return to their homes to be constantly admonished by their parents to hold themselves up; when this has failed of the desired effect, and the mother seeks advice because one hip is growing out, and one shoulder is higher than the other, she is told that her daughter will "grow out of it."

The first stage of what is hoped to be a "growing out of it" leads to the second stage, when a clumsy steel jacket or a plaster cast is ordered, and so leads to the third stage, when the helpless mother realizes that instead of "growing out of it," her daughter has grown into such a hopeless deformity that no science on earth will help her to outgrow.

Many deviations of the spine, unassociated with disease, lateral curvature, etc., yield within a few months to specific muscle culture. By simple exercises daily taken, the muscles of the back of the neck can be so strengthened that the head will rest gracefully and naturally upon the neck, without

stiffness. Bending the head back and forth, stretching the large, heavy muscles at the back of the neck, and strengthening them, and twisting the head slowly, resting it first on one shoulder, then on the other, are invaluable; the head, held erect, helps to straighten the spine; it raises the chest to that high, self-confident position; the height is considerably increased, and the lungs have their chance to develop.

Deep breathing is the most helpful of these means. The true method of breathing is so little understood, that many persons who consciously practice deep breathing exercises are remarkable for their flat chests and enlarged abdomen. This is always due to an incorrect posture in breathing. Nature has given us splendid muscles for supporting and balancing the figure. These lie across the abdomen, and are strong and elastic as the stoutest India rubber. If abdominal muscles are properly strengthened, abdominal enlargement, which mars the most promising figure, would

never be seen, and elastic belts and certain corsets, thought to correct this evil, would never be needed.

Specific exercises for abdominal area: These exercises cause contraction of the muscles of the abdomen, and lace, so to speak, the natural corset, which is formed of the strong muscles overlying the abdomen.

Bending slowly back and forth, from a sitting position, is one of the best exercises. Sit erect in your chair, then lean forward until the face is on a level or between the knees, then return to the original position, and repeat. The exercise of the imaginary lifting of heavy weights is valuable. The weight must be imaginary, however, for no woman should lift a heavy weight at any time, under any circumstances. Place your hands beneath a desk or table, and pretend to lift it; besides causing the abdomen to be straight and flat, these exercises improve the complexion, by contracting the muscles which press upon the liver, increasing the circulation, necessary to its perfect health.

When the liver is sluggish, there is a congestion and enlargement of the abdomen. Stirring the liver to its right activity relieves this. Indigestion, too, will be relieved by these exercises.

When children leave the stage of babyhood, which is at the age of three, they should be taught how to stand, walk and breathe correctly, especially when there is the least disposition on the part of the child to be weak, otherwise the shoulders droop, the spine curves to one side, the chest sinks in, and the great organs are crowded out of shape and position. To prevent most of the unsightly conditions, that may well be termed slight deformities, and which can be observed in nine out of every ten children; "pigeon" chest, drooping and round shoulders, knock knees, weak ankles, parrot toes, crooked backs, etc., physical training of the highest and most effective kind must be gone through daily, just as faithfully as eating, drinking and sleeping, and such exercises will overcome almost every imperfec-

tion which hampers proper body development, and will strengthen every tissue and muscle in the body.

These exercises can be made interesting and delightful. They must never suggest work, as even the youngest child is averse to anything that fails to excite and hold his attention. Have you ever noticed how instinctively a child's body sways to the rhythm of music? In a room bathed with fresh air and sunshine, or better still, out of doors, make the children march, then run lightly, then have stationary running, but the first exercise for each class should be the balancing movements. For years, whenever the weather permitted, I held my classes on the lake shore in a quiet, secluded part, and I am certain that each young pupil felt her work there the most sacred of the day. So much for the little ones just emerging from babyhood.

When the children reach the age of comprehension, and can be told the reason for things, their physical training may assume

larger proportions; they should be taught why it is best that every muscle in the body should be exercised, and every joint kept supple. The important feature of this method is that each exercise is designed to create expression in the body. Expression is the art of all arts, and nobody's education is complete without it. The fine arts are all arts of expression, and every exercise that the pupils perform is gone through with the conviction that we are getting the utmost joy and expression out of it, for no pupils like to go through exercises in a dull, mechanical way. Nothing stimulates a child so much as to feel that he is being trained to express himself individually. The deep breathing exercise stimulates the lungs and heart, and sends the blood coursing through the tissues. It hurries along the circulation, and keeps the body bathed in pure, fresh blood. Children who are taught this form of expressional training soon develop into strong, graceful young men and women. They soon acquire ease and grace of movement.

Our famous colleges, Smith, Wellesley, Vassar and Bryn Mawr should at once introduce this system of expressional training, which should proceed on the simple but intelligent plan of first training the weaker muscles of each pupil, then developing a finely poised body, and next the various expressional movements, or exercises, devised to produce a graceful walk and fine carriage of the body. Should not the training in our women's colleges be at least as scientific and as thorough as that of West Point? In the one case it is the beautiful army of womanhood, whose chief function from the early dawn of life is the civilization of humanity—"The Army of Motherhood" for the upbuilding of our race. Is not the physical training of this great army even more important, for it deals primarily with the giving of life, a far more important problem than the training of the West Pointer for war, or the taking of life? Is it a rational system of intellectual progress, which brings out a bright intellect in a half

developed body, while the parents hope for great things in the future, when the body has had no training adequate to justify the belief that there will be much of any future? Is not a crooked body, defective eyes and hearing, disagreeable voice, as we so often notice in our young college girls, a rather dear price to pay for our shallow intellectuality?

Herbert Spencer says, "On women the effects of this forcing system are, if possible, even more injurious than on boys, being in a great measure debarred from these vigorous and enjoyable exercises of the body, by which boys mitigate the evils of excessive study. Girls feel these evils in their full intensity, hence the much smaller portion of them grow up well made and healthy. In the pale, angular, flat-chested young ladies, so abundant in London drawing-rooms, we see the effect of merciless application, unrelieved by youthful sports, and this physical degeneracy exhibited by them hinders their welfare far more than their many accomplishments aid it."

A series of careful investigations, covering a period of fifteen years, have forced upon me the deep conviction that young women are often permanently injured in acquiring gymnastic skill and hard muscles which seriously lessens their capacity for normal motherhood. This is due to injurious athletic training. Teachers are put in charge of the physical training of young girls, who while they may be superior gymnasts themselves, possess neither the judgment nor the training to estimate a girl's physical condition, guarding her carefully, at times, and then forcing her, when she is inert or indifferent.

No one set of exercises for all, but individual training for the individual; in this way only can we avoid muscle lesions, displaced pelvic organs, and strained heart and abdominal muscles. The free out-of-door life, so invaluable when properly conducted, may often lead to years of permanent invalidism. The training should be progressive, beginning with the simplest breathing,

stretching and balancing exercises. Develop the weak muscles and build up the body until it is symmetrical and well poised. The physical training of girls is far more important than that of boys.

Thousands of years before the Christian Era, the physical education of girls was made compulsory, because through them was obtained the continuation of the race.

Young men go out of school and learn a trade, an art or a liberal profession, but most of the girls stay at home to learn the highest of all arts, "Motherhood," an art which requires more brains than all the other arts and sciences. Therefore, if one sex needs more education, better brains and more finely developed bodies than the other, it is the young woman, because when he is buying, selling, manufacturing, she is refining the souls of her children.

The genius of Modern Science has given us a new view of the body, its functions and its needs. It is not enough to enlighten the brain; the body also must be educated, and

the diffusion of this knowledge is the sheet-anchor of civilization.

Multitudinous signs are present that proclaim the approach of another divine day, wherein man and nature shall be rejuvenated, and civilization will move upward as well as onward. The moral tide is rising, and it will rise more rapidly.

The dawn is stealing over the eastern heights; the crest of the mountains is aureoled in a glory that prophesies the coming light; a glow of pink, delicate as the throat of a shell, is flushing the sky, and soon the rose and purple of the dawn of The New Education will flame in splendor on the Earth.

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